Draft Cleanup Action Plan

Midway Landfill
Kent, Washington

Prepared for
Department of Ecology
Northwest Regional Office
Toxics Cleanup Program

Prepared by
City of Seattle
Seattle Public Utilities
Solid Waste Operations

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1.0 Introduction

1.1 AUTHORITY

This document presents the Cleanup Action Plan (CAP) for the Midway Landfill located in Kent, King County, Washington. It is prepared as part of the site cleanup process established by the Washington State Department of Ecology (Ecology) under Chapter 173-340 WAC, *Model Toxics Control Act—Cleanup Regulation* (MTCA), and meets the requirements specified in WAC 173-340-360(10), "Cleanup Action Plan." This CAP is the "substantial equivalent" of a CAP and associated cleanup conducted or supervised by Ecology.

In October 1984, Midway Landfill was nominated for inclusion on the federal National Priorities List (NPL). Following that nomination, Ecology was designated as the lead agency for the Midway Landfill Superfund action, pursuant to a Cooperative Agreement with the United States Environmental Protection Agency (EPA). In May 1986, Midway Landfill was placed on the NPL. In September 1988, the City of Seattle (City), which owned and had operated Midway Landfill, entered a Response Order on Consent with Ecology. This Response Order governed the preparation of a Remedial Investigation and a Remedial Action Feasibility Study (RI/FS) for the landfill. These documents were completed in 1988 and 1990, respectively.

In May 1990, prior to completion of the RI/FS, the City and Ecology entered into a Consent Decree pursuant to MTCA. This Consent Decree set forth Ecology's determination regarding the final remedial action required at the Midway Landfill. This remedial action was comprised of three elements:

1. Construction of a landfill cover ("cap"), which included complete regrading of the site and installation of a multi-layer engineered cover.
2. Completion of a landfill gas extraction system, including gas manifolds and flares.
3. Completion of a surface water management system, including controls to prevent surface water from infiltrating the site, construction of a major surface pond, and rerouting of storm water from surrounding areas to prevent it from entering the landfill.

The Consent Decree required the preparation of final project reports for each of these elements, as well as preparation of a comprehensive landfill Operation and Maintenance Manual for both short-term and long-term operation and maintenance for projects constructed pursuant to the decree. The Consent Decree further required that each element of the work to be performed be designated, implemented and completed in accordance with the requirements of CERCLA (42 USC 9603), MTCA (RCW 70.105D), applicable federal, state, and local laws and regulations, and applicable EPA guidance documents.

All elements of the final remedial action at the Midway Landfill as required by the 1990 Consent Decree have been completed. Final Reports have been submitted to Ecology by the City, and Ecology has provided written certification, pursuant to Section XXXVI of the Decree, that the program outlined in the decree has been completed.

Assuming this will be true when this CAP goes out to public

1.2 PURPOSE AND OBJECTIVES

The CAP for the Midway Landfill is limited to those actions required to address contamination in groundwater downgradient of the landfill site. Its purpose is to establish both points of compliance and cleanup levels (pursuant to MTCA) specific to such groundwater contamination. It does not address closure or cleanup activities that have occurred within the boundaries of the Midway Landfill, as such actions were completed as part of the Final Remedy pursuant to the 1990 Consent Decree.

The specific objectives of the CAP include:

- Description of the site, including a summary of its history and the nature and extent of groundwater contamination as determined by the Remedial Investigation (RI) and other studies.
- Summary of current groundwater conditions and usage.
- Identification of chemicals of concern (COCs) for groundwater, cleanup levels, remedial action levels, and points of compliance.
- Description of the selected remedy for offsite groundwater, summary of institutional controls and groundwater monitoring requirements.
- Provision of a document that facilitates transfer of regulatory jurisdiction for the Midway Landfill from Ecology's Toxics Cleanup Program (under WAC 173-340) to the Seattle-King County Department of Public Health's Landfill Closure Group (under Minimum Functional Standards, WAC 173-304), and future delisting from state and federal hazardous sites lists.

Based on Summit Meeting, this will need to be modified. Let's discuss how much of it we can keep to set the stage for future documents, and eliminate those pieces that cause too much heart burn.

2.0 Site Background Information

2.1 SITE LOCATION

The Midway Landfill is located in south King County in Kent, Washington, directly east of the city of Des Moines. The City of Seattle Engineering Department, Solid Waste Utility, leased the 60-acre Midway Landfill from Midway Sand and Gravel, and operated it as a landfill from 1966 to 1983. Midway Landfill is now owned by the City of Seattle.

The landfill site is bounded by State Route 99 (SR-99) to the west, Interstate 5 (I-5) to the east, 252nd Street to the south, and commercial, industrial, and residential properties to the north. Puget Sound is approximately one mile to the west, and the Green River lies approximately one mile to the east. The location of the landfill and the surrounding vicinity is shown in Figure 2-1.

The Midway Landfill is surrounded by low- to medium-density urban populations. Land use in the landfill vicinity consists primarily of commercial activities and residential development of various densities (Figure 2-2). Most land with potential future residential use is west of the landfill and SR-99. The commercial establishments and light industry and manufacturing border both sides of SR-99 in the area. Two elementary schools, Sunnycrest Elementary School and Parkside Elementary School, and a city park, Linda Heights Park, are within a half-mile radius of the site. Most of the nearby residences are detached single-family dwellings, with some multi-unit residential developments to the south and west. Several mobile home parks are also in the vicinity. A six-acre wetland, the Parkside Wetland, to the east of the Parkside Elementary School and west of the landfill is a naturally occurring detention basin for local surface water runoff, primarily from the west side of SR-99.

2.2 GEOGRAPHIC DESCRIPTION

The Midway Landfill is located near the crest of a narrow north-south portion of land known as the Des Moines Drift Plain. This area, referred to as "upland" because of its location above adjacent valleys and sea level, is bordered by Puget Sound on the west and the Green River valley on the east. Maximum elevations along the crest of the upland generally range from 400 to 450 feet above mean sea level (MSL). Puget Sound is at sea level, and the Green River valley floor typically averages about 30 feet above MSL.

The upland area is cut with a number of steep-sided stream valleys. Midway Creek is located northeast of the landfill, and two other streams, the north and south forks of McSorley Creek (formerly Smith Creek), are located to the west and southwest respectively (Figure 2-3).

The Midway Landfill occupies a shallow, bowl-shaped depression near the crest of the upland. The surface of the landfill generally ranges from 360 to 400 feet above MSL and slopes upward to the south and east. West of the landfill, the land surface is nearly flat across SR-99 and then drops steeply downward approximately 100 feet to the Parkside Wetland (Figure 2-3).

There is no major surface water body in the immediate vicinity of the Midway Landfill. The closest are Lake Fenwick, located approximately one mile to the southeast, and Star Lake, located approximately 1.5 miles to the south (Figure 2-3).

2.3 SITE HISTORY

From 1945 to 1966, the site of the current Midway Landfill was operated as a gravel pit. Originally, the pit was adjacent to a natural drainage basin often used as a settling pond. This basin, known as Lake Meade, was located northeast from the center of the present landfill. As the pit was mined, water was drawn from Lake Meade to wash silt and clay from the gravel and sand, and then returned to the lake. This silt and clay settled on the lake bottom. Near the end of the gravel pit operation, the lake was drained into the southern end of the gravel pit, depositing a layer of clay and silt into the bottom of the pit. This layer of fine materials currently underlies much, but not all, of the present landfill.

In January 1966, the City leased the site and began using it as a landfill for nonputrescible waste. In 1960s solid waste terminology, "nonputrescible" waste was differentiated from "putrescible" waste mainly by its rate of decomposition. The category of putrescible waste included rapidly decomposing food scraps, such as household and restaurant garbage. The category of nonputrescible waste included materials that decompose slowly, such as demolition debris and wood wastes.

From 1966 to 1983, approximately three million cubic yards of solid waste were deposited at the Midway Landfill. The exact dimensions of the bottom of the landfill are not known. However, existing boreholes indicate that the solid waste extends to depths of as much as 130 feet in some places.

The Midway Landfill was created primarily to accept demolition materials, wood waste and other nonputrescible materials. However, there is evidence that industrial wastes were also placed in the landfill. By 1980 a state-mandated screening process administered by the Seattle-King County Department of Public Health was in place.

When the City closed the landfill in the fall of 1983, it began extensive testing of water and gas in the landfill and its vicinity. Samples of leachate and groundwater from monitoring wells in and around the landfill and gas samples from onsite and offsite gas probes indicated the presence of organic and inorganic contaminants with a potential for offsite migration. Subsequently, Ecology also began investigating the site.

In May 1986, the EPA placed the site on the Superfund NPL for cleanup based on potential groundwater contamination. In August 1986, the City, under Ecology oversight (as described in Section 1) initiated a remedial investigation.

2.4 SITE REPORTS

In 1986, the City and Ecology developed a work plan, a sampling and analysis plan, and a scope of work for the RI. The major contaminant pathways studied were groundwater, surface water, seeps, soils, landfill gas, and air. The following Midway Landfill Remedial Investigation reports were generated:

- Air Quality Technical Report (Parametrix, 1988a)
- Landfill Gas Technical Report (Parametrix, 1988b)
- Surface Water Technical Report (Parametrix, 1988c)

- Groundwater Technical Report (Parametrix, 1988d)
- Summary Report (Parametrix, 1988e)

After the RI reports had been published and the feasibility study (FS) phase of the project begun, additional investigative reports were published to fill data gaps and to present new findings. These reports were:

- Leachate Characterization Report (AGI, 1990a)
- Groundwater and Leachate Control Evaluation (AGI, 1990b)
- Supplemental Hydrological and Hydrochemical Investigation (AGI, 1990c)

The FS was comprised of six reports:

- Landfill Cover Focused Feasibility Study (Woodward-Clyde, 1989)
- Midway Landfill Feasibility Study - Groundwater, Surface Water, Seeps, and Soils Pathways (Parametrix, 1990d)
- Midway Landfill Endangerment Assessment - Air, Gas, Stormwater Pathways (Parametrix, 1990a)
- Midway Landfill Feasibility Study - Air, Gas, Stormwater Pathways (Parametrix, 1990a)
- Midway Landfill Endangerment Assessment - Groundwater, Surface Water, Seeps, and Soils Pathways (Parametrix, 1990b)
- Midway Landfill Feasibility Study Treatability Study Report (Parametrix, 1990c)

Starting in late 1989, the City established a monthly monitoring program to measure fluid levels and oil thicknesses in onsite and selected offsite wells. Oil has never been detected in offsite wells. The purpose of this performance monitoring was to maintain a record of fluid levels in and around the landfill over time. This was important to establish a baseline against which later measurements could be compared after remedial actions had been completed. This performance monitoring is currently performed twice a year. Quarterly water quality monitoring was begun in 1990 to develop a database for water quality in selected groundwater monitoring wells. This monitoring program, which became the compliance monitoring program, was modified in 1993 and again in 1998 with concurrence from Ecology. These groundwater monitoring programs continue presently on a twice-yearly basis.

Data reports and technical memorandum have been published as follows:

- Water Level and Oil Thickness Monitoring (AGI & Parametrix, 1989-1997)
- Groundwater Quarterly Monitoring Reports (AGI & Parametrix, 1990-1997)
- Groundwater Remediation Status Reports (Parametrix & Emerald, 1994-1997)
- The Midway Landfill Compliance and Performance Monitoring Technical Memorandum (Parametrix, 1993).

2.5 FINAL REMEDY

The 1990 Consent Decree set forth the Final Remedy for the Midway Landfill. The components of the remedy, which were reviewed and approved by Ecology prior to construction, were determined by Ecology to provide protection to the environment and to the public health and welfare. Specifically, the Consent Decree required the following:

- Completion of a multi-layered Landfill Cover System ("cap") comprised of layers of low permeability clayey silt/silty clay, a 50-mil synthetic membrane, a geonet drainage layer, one foot of sand and one foot of topsoil planted with shallow rooted grasses. Ecology determined that this cover would provide long-term minimization of the migration of liquids through the closed landfill, and that it would control, minimize or eliminate, to the extent necessary to protect human health and the environment, post-closure escape of hazardous emissions from the landfill.
- Completion of a gas extraction system, including a Final Gas Manifold System to link onsite extraction wells to an enhanced motor blower and flare system. The purpose of the onsite extraction wells was to create a "vacuum curtain" around the closed landfill to prevent offsite migration of landfill gas, and to help draw previously migrated gas back to the landfill. The enhanced flares were installed to burn the extracted gas before discharge to the atmosphere. The gas extraction system also included approximately 127 offsite gas monitoring probes to provide data on the extent of landfill gas migration and the effectiveness of the extraction system.
- Completion of a Surface Water Management System. This system consisted of:
  1) site filling and grading to control surface water drainage;
  2) construction of a 10-million gallon stormwater detention pond with a permanent dewatering system;
  3) a flow system to discharge surface water to McSorley Creek; and
  4) diversion of the Linda Heights Park drain and surface water runoff from I-5 to the detention pond.
- Preparation of a comprehensive Operation and Maintenance Manual incorporating both short- and long-term operation and maintenance requirements for all remedial actions implemented at the landfill as part of the Decree.

The City also initiated performance and compliance monitoring programs at the landfill as part of the Final Remedy. Performance monitoring (which did not include chemical analysis) was intended to track the response of landfill leachate and shallow groundwater levels in the saturated refuse and the Upper Gravel Aquifer (UGA) to the implementation of the Final Remedy. Compliance monitoring was intended to track the presence, concentrations and migration of groundwater contaminants both upgradient and downgradient of the landfill, and to assess the effectiveness of the Final Remedy in protecting human health and the environment by controlling the leachate source. Both monitoring programs are ongoing, and their results are summarized in Annual Groundwater Remediation Status Reports. The scope of these programs is described in the draft "Compliance and Performance Monitoring Sampling and Analysis Plan" (Parametrix, 1999c).

Finally, the Consent Decree required the City to place a notice in the records of real property kept by the county auditor stating that the landfill was on the NPL, and to serve a copy of the Decree upon any prospective purchaser, lessee, transferee, assignee, or other successor in interest to the property prior to the transfer of any legal or equitable interest in all or any portion of the landfill.

The Restrictive Covenant is working its way through SPU and Seattle Law. It is based on the AG's template with language added from the Kent Highlands Landfill restrictive covenant. We will send over the proposed language as soon as we get the go-ahead from management.

3.0 Site Conditions

3.1 GEOLOGY

Site geology and hydrogeology have had a controlling influence on the movement of contaminants in the vicinity of Midway Landfill, and on the selection and design of the Final Remedy. This section will present information necessary to understand both the extent of contamination and the impact of the completed actions. A much more detailed discussion of site geology and hydrogeology is presented in the results from the RI (Parametrix, 1988) and in the Hydrogeology Technical Memorandum (AGI, 1988). A summary of this information is presented below.

The Midway Landfill is located on a north-south trending glacial feature known as the Des Moines Drift Plain. The Drift Plain is part of the Puget Lowland that lies between the Olympic Mountains on the west and the Cascade Mountains on the east. The Puget Lowland is underlain by a thick sequence of Quaternary glacial, fluvial (riverine), and lacustrine (lake bed) deposits overlying Tertiary volcanic and sedimentary bedrock. Depth to bedrock is thought to exceed 1,000 feet near Midway Landfill. Deposits of at least four glaciations have been identified in the Puget Sound Lowland. The most recent glaciation, the Fraser, consisted of two stages: the Vashon (oldest) and Sumus (most recent).

The Des Moines Drift Plain is a depositional feature of the glaciations of Puget Sound. As such, it consists of complex and interbedded layers of coarse materials deposited by glacial streams, tight, low permeability tills formed by the weight of the over-riding glaciers, and fine-grained stream and lake deposits laid down in during interglacial and recent periods.

Based on earlier studies of the area and analysis of geological samples collected during the installation of monitoring wells for the RI, a conceptual model of the geologic setting at the Midway Landfill was developed. The model is defined from land surface down approximately 400 feet to sediments that are near current mean sea level. The model can be divided into nine stratigraphically distinct deposits as follows:

1. **Fill.** This is imported material brought in during building and road construction activities. Depths range from 10 to 100 feet.

2. **Midway Landfill.** This includes solid waste materials as discussed above in Section 2.3. This fill may range from 40 to 130 feet thick and lies under an earthen cap two to 14 feet thick. In many areas, a layer of silt/clay fill occurs at the base of the landfill as a result of gravel washing. This layer reaches up to 25 feet in thickness in places in the southern section of the landfill. Up to four feet of peat exists beneath some areas in the northern portion of the landfill.

3. **Recent Alluvium.** These sediments underlie the Parkside Wetlands area and consist of a layer of peat up to 17 feet thick underlain by approximately nine feet of interbedded fine-grained sand, silt, and clay on a bed of 25 feet of massive to laminated silt. The recent alluvium appears to have originated in a lake that occupied the wetland before the peat bog developed.

4. **Vashon Recessional Outwash.** This consists of scattered deposits of fluvial sand found beneath fill or at land surface around the landfill. Most of these deposits appear to be eskers or braided stream deposits.

5. **Vashon Till.** This is a dense, non-stratified, non-sorted mixture of clay, silt, sand and gravel believed to have been deposited beneath the overriding ice sheet. Till thickness has been observed up to 25 feet and could be greater.

6. **Vashon Advance Outwash.** This is fluvial and gravelly sand up to 40 feet thick, originating from melt waters issuing from the advancing Vashon glaciers.

7. **Outwash Gravels.** This is a deposit of silty gravel, sandy gravel and gravelly sand believed to predate the Vashon glacier and possibly correlate with the Salmon Springs Drift. This deposit ranges up to 200 feet thick.

8. **Deltaic Sediments.** These sediments consist largely of sand, silty sand, and silt with some wood fragments and organic matter, as well as volcanic ash in the lower portion. The Deltaic Sediments range from 80 to 180 feet in thickness, and are thought to be a finer-grain section of the Salmon Springs outwash.

9. **Non-glacial Sediments.** These sediments are a heterogeneous deposit of coarse-grained silty or sandy gravels with intervening beds of fine-grained silt or silty sand. Some wood fragments are present. Also present are locally abundant, finely divided organic matter. The bottom of the deposit is not defined, but there is evidence that the sediments become finer grained with depth. The sediments appear to have originated in the Cascade Mountains, and are believed to correlate with the Puyallup Formation.

The relationship of the nine stratigraphic layers and the hydrostratigraphic units beneath the Midway Landfill is shown in Figure 3-1. Because of the complex layering in all the sediments underlying the landfill, vertical and horizontal permeabilities are highly variable. As discussed in the next section, this juxtaposition of higher permeability zones with lower permeability zones dictates the direction and quantity of groundwater flow, and produces a complex groundwater flow pattern.

3.2 HYDROGEOLOGY

Groundwater movement within and below the landfill has been characterized to an approximate depth of 300 to 350 feet below ground surface (50 to 100 feet above mean sea level (MSL)). Several groundwater units have been identified within this interval, including (from shallowest to deepest):

- Shallow groundwater (referred to as the "Perched Aquifer" in the RI/FS documents)
- Saturated refuse (referred to as the "Landfill Aquifer" in the RI/FS documents)
- Upper Gravel Aquifer (UGA)
- Sand Aquifer (SA)
- Southern Gravel Aquifer (SGA) and Northern Gravel Aquifer (NGA)

The line of the generalized cross section of the monitored units is shown in Figure 3-2, and north-south and east-west cross sections are shown in Figures 3-3 and 3-4.

3.2.1 Shallow Groundwater

This zone of saturation was described in the RI as shallow, discontinuous lenses of groundwater perched on low permeability deposits above the UGA. Field work and data analyses since completion of the RI indicate that groundwater in this unit is shallow, discontinuous, and of very limited areal extent. However, it is not always perched above low permeability materials. The majority of these shallow zones are found north of the landfill, and south of the landfill. Figure 3-5 shows the general water elevation of the shallow groundwater zone adjacent to the landfill. It is generally at about 325 feet elevation north and south of the landfill, and lower, and more discontinuous to the east and west.

The detention pond dewatering system affects shallow groundwater flow through areas along the northern periphery of the landfill. Specifically, shallow groundwater north of the landfill that exists at 320 feet or higher in elevation is captured by the pond's dewatering system and routed to McSorley Creek. This limits the capacity of the shallow groundwater to discharge into the landfill from the north; however, groundwater deeper than 320 feet in elevation can and does discharge into the landfill from the north. Shallow groundwater also occurs in disconnected zones south of the landfill at an elevation of approximately 325 feet, and discharges, at least seasonally, into the landfill.

3.2.2 Landfill Leachate

The saturated zone within the landfill consists of leachate mixed with refuse and soil. Prior to remediation, the major sources of water to the landfill were:

1) infiltrating surface water from the landfill surface and from areas north of the landfill that drained into the landfill,
2) stormwater discharge from the Linda Heights neighborhood and I-5 that was routed into the landfill as part of the construction of I-5, and
3) shallow groundwater from north and south of the landfill.

When the water came in contact with refuse, it leached salts and other chemicals from the refuse to form landfill leachate. Figure 3-6 shows the elevation of the base of refuse. Refuse located below elevations of approximately 325 feet was generally saturated before the Final Remedy was constructed. The occurrence and movement of the leachate were largely functions of the former gravel pit topography. Flow in the refuse was generally from the north and west toward the south-central section of the landfill, where the pit excavations were deepest. Leachate may have discharged vertically throughout much of the landfill base although the rate of discharge was limited by the fine-grained material deposited during gravel-pit operations. The silts and clays were deposited into the deepest sections of the landfill, where they extend up to 25 feet in depth. Prior to remediation, the greatest volume of vertical flow was in the south-central area, where leachate discharged to the underlying UGA.

Since construction of the Final Remedy, between 75 and 90 percent of the water that entered the landfill each year has been diverted (Parametrix, 1999b) and leachate levels have dropped significantly, as shown in Figure 3-7. Levels have dropped by as much as 20 feet. This corresponds to a 90 percent reduction in the amount of saturated refuse based on the differences between the 1988 and 1998 saturated refuse contours (Parametrix, 1999b). The drop in leachate production and levels is a direct consequence of the construction of the Final Remedy, which acted to block infiltration of rainwater, and stopped the introduction of large volumes of stormwater from adjacent neighborhoods and I-5. The only remaining sources of water to the landfill are the shallow, discontinuous zones of groundwater north and south of the landfill.

Figure 3-8 shows the remaining areas with saturated refuse. The shaded areas represent dewatered refuse; the unshaded areas represent areas in which the base of refuse is still wet. These saturated areas are generally between two and 10 feet in thickness, and are generally perched above the clay and silt base remaining from the gravel mining operation. Because of historical lows in the gravel pit topography, two zones exist where the refuse is deeper. In many areas of the landfill the base is effectively a leaky silt/clay aquitard. Leachate perched on this base slowly evaporates into the gas system and leaks through the base into the Upper Gravel Aquifer, described below.

3.2.3 The Upper Gravel Aquifer and the Upper Silt Aquitard

Fifty to one hundred feet of outwash gravels underlie the low permeability layer at the base of the landfill. These gravels consist of interbedded zones of permeable gravels and less permeable mixtures of silt, sand, and gravels. Prior to construction of the Final Remedy, discharge from the landfill resulted in significant areas of saturation within the unit, especially in water-bearing strata at the base of the unit, where several monitoring wells were placed. Water quality in these wells, prior to remedial action, showed significant impacts from leachate.

Groundwater flow in the UGA is generally from both the north and south inward toward an area beneath the southern end of the landfill where the groundwater discharges downward into the underlying SA. The UGA and SA are separated by the Upper Silt Aquitard, a discontinuous layer of fine-grained silt, clayey silt, and silty fine sand that is present throughout most of the study area. Vertical flow from the UGA into the SA is most pronounced in places where the aquitard is absent. One of these "windows" in the aquitard exists beneath the southern end of the landfill, where it allows the discharge from the UGA into the SA to occur. Discharge through this window was manifested as a distinct groundwater sink (an area of low potentiometric surface) during the RI.

The construction of the Final Remedy and the subsequent dewatering of the refuse have greatly reduced the amount of recharge entering this unit. The response of this unit to changing conditions at the landfill was strong and rapid, as indicated by the monitoring wells installed in the base of the unit going dry as early as 1992, and remaining dry since then, except for a single round of measurements. Discontinuous lenses of groundwater exist within this unit primarily due to regional groundwater recharge, but the area below the landfill is dominated by unsaturated conditions. Leachate leaking through the base of the landfill travels through 20 to 50 feet of primarily unsaturated soils before encountering regional groundwater. The Final Remedy has eliminated the potential for a continuous saturated flow pathway from the landfill into the regional system.

Figure 3-9 shows the current potentiometric surface of the UGA. Groundwater continues to enter the UGA north and south of the landfill, and continues to flow toward the sink beneath the southern part of the landfill. However, the sink appears to have "deepened" due to the loss of recharge from the landfill. Monitoring wells designed to monitor water quality conditions in the UGA within the landfill footprint and around the perimeter have been dry for several years, even with rainfall that was significantly greater than average during the years from 1997 to 1999. The actual potentiometric head beneath the landfill may be lower than shown, since the monitoring wells at the base of the unit are dry.

The UGA beneath the landfill is under vacuum from the landfill gas collection system. Figure 3-10 shows the extent of the vacuum system beneath the landfill. Any leachate leaking through the base of the landfill and infiltrating into this zone moves mostly by unsaturated flow and is directly exposed to the vacuum under conditions designed to strip volatile organics from the infiltrating water. This combination of predominately unsaturated conditions in the aquifer and the vacuum from the gas extraction system acts to contain volatile organics from being released to the regional groundwater system. This was demonstrated by the rapid improvement in groundwater quality in the underlying Sand Aquifer shortly after the UGA monitoring wells went dry. Volatile organics, including COCs, were less than cleanup levels (see discussion in Chapter 4) in the downgradient SA wells within 1 year of the UGA wells going dry.

3.2.4 The Sand Aquifer and the Lower Silt Aquitard

The SA occurs as a widespread regional deposit of interbedded sands and silts. Flow in this aquifer in the vicinity of the landfill is generally from the north and west to the southeast toward an apparent hydraulic sink. The sink occurs across a broad area beneath the southern part of the landfill and extending several hundred feet to the east. Groundwater to the south and east of this sink also flows towards the sink. Consequently, the sink limits the extent that the landfill impacts the SA, and impacts are not seen beyond the sink to the east. Groundwater entering this sink flows downward into the SGA.

The deepening of the sink in the UGA as the landfill dewatered is also seen in the SA where the SA sink has also deepened over the last 5 years. The two SA monitoring wells within the footprint of the landfill are currently dry, and have been for several years; the other two SA monitoring wells, which are located further from the landfill, only contain water during years with above average precipitation. As with the UGA, the potentiometric surface in areas upgradient and distant from the landfill has not changed appreciably since the remediation. The current potentiometric surface of the SA is shown in Figure 3-11.

The SA and SGA are separated by the Lower Silt Aquitard. Like the Upper Silt Aquitard, the Lower Silt Aquitard is present as a significant unit throughout the site, but is discontinuous in places. These "windows" in the aquitard allow for the downward flow from the SA into the SGA. The largest such window identified in the study area exists below the sink in the SA, and is believed to be its cause.

The Southern and Northern Gravel Aquifers

The deepest stratigraphic units studied are the Northern and Southern Gravel Aquifers; they occur at about the same elevation, but hydraulic heads in the NGA are typically 100 feet higher than heads in the SGA. During the RI, the NGA was found to be clean and unimpacted.

The SGA is found beneath the southern half of the landfill and extends to the east, south and west. It consists of permeable sands and gravel interbedded with silts and silty gravel. The SGA appears to be recharged by the SA and by lateral flow from the south. A groundwater mound in the SGA, below the hydraulic sink in the SA, is believed to be an expression of regional flow through the sink. Groundwater flow from the mound is to the east and west; flow to the north is blocked by higher potentiometric heads within the NGA. Groundwater in the SGA eventually discharges west to Puget Sound and east to the Green River Valley. The current potentiometric surface of the SGA is shown in Figure 3-12. Although the groundwater mound is still present, water levels along the historical high point (MW-14B, for example) have dropped by as much as 10 feet from pre-remedial conditions. Indicating that the reduction in leachate has been felt as far down in the groundwater system as the SGA.

Responses to changing recharge conditions have been fairly rapid between the base of the landfill and the SGA, with decreases in the SGA water levels occurring in less than 5 years from completion of the remedy. Once groundwater enters the SGA, the primary direction of flow shifts from vertically downward to horizontal, with much lower potentiometric heads driving the flow. Consequently, changes in SGA as water moves horizontally away from the landfill will be much slower. Groundwater flow rates in this lower zone are estimated to average ___ feet per year (AGI, 1988).

3.3 GROUNDWATER QUALITY

3.3.1 Leachate

Leachate is generated if water (or other liquid) is present in the refuse. The water becomes contaminated with chemicals that are dissolved from the waste, suspended in the liquid, or formed as part of microbial decomposition of the waste. If artificial or natural barriers do not exist, leachate can flow offsite and discharge to surface water or groundwater. Midway Landfill was located in a natural drainage basin from which surface water does not exit. Leachate, therefore, discharged to groundwater only. The primary discharge locations were through the base of the landfill to approximately 100 to 150 feet below ground surface. Leachate discharged through the leaky base of the landfill and traveled vertically downward into the underlying UGA.

Studies conducted during the RI established that infiltration of precipitation and direct discharge of stormwater into the solid waste generated large quantities of leachate at the Midway Landfill. Most of the leachate from the landfill was aqueous. A small amount of floating light non-aqueous phase liquid (LNAPL) was also detected in the landfill. Dense non-aqueous phase liquid (DNAPL) has never been detected at the landfill. The LNAPL appeared to be heavy petroleum oil containing polychlorinated biphenyls (PCBs). The specific gravity, viscosity, and PCB concentration of the LNAPL vary between locations within the landfill.

Leachate samples were collected as part of the RI and analyzed for conventional water quality parameters and compounds on the EPA hazardous substance list, including metals, volatile organic compounds (VOCs), pesticides and other potentially hazardous substances. Results from these analyses indicated:

- The aqueous leachate contained aromatic and aliphatic hydrocarbons, dissolved salts, suspended particulates and low levels of VOCs and metals. Polycyclic aromatic hydrocarbons (PAHs) and PCBs were only detected in LNAPL samples from onsite wells located adjacent to or in direct contact with LNAPL pools. Neither PAHs nor PCBs were ever detected in groundwater.
- The LNAPL contained metals, VOCs including trans-1,2-dichloroethene and the BETX group (benzene, ethylbenzene, toluene and xylene), PAHs commonly detected in petroleum oil, and PCBs.
- Leachate from the Midway Landfill was not found to constitute a hazardous or dangerous waste (AGI, 1990a).

Additionally, the Endangerment Assessment (EA) found that there was no direct exposure pathway connecting leachate to either human or ecological receptors. The only potential exposure pathways existed through cross-media pathways: volatilization of contaminants from leachate into landfill gas or discharge of leachate into the groundwater system (Parametrix, 1990b). The contaminants in landfill gas were found to pose a negligible risk (Parametrix, 1988b) leaving leachate to groundwater as the only migration pathway of concern (Parametrix, 1990b).

3.3.2 Groundwater

Between October 1986 and January 1990, a total of 56 groundwater wells were installed and sampled in 41 locations upgradient and downgradient of the Midway Landfill (many wells have multiple completions at the same location). Samples from these locations were analyzed for conventional water quality parameters and hazardous substance list chemicals. From these results, the extent of contaminant migration into the groundwater system beneath the landfill was estimated using specific chemicals as indicators of leachate movement within the aquifers. The most useful of the indicator chemicals was chloride, which acted as a conservative tracer of groundwater movement. Because chloride concentrations in the landfill leachate are several hundred times greater than background groundwater concentrations, elevated chloride was used to delineate the extent of the contaminant plume. The concentrations of manganese (a naturally occurring metal that is often elevated downgradient of landfills) and chlorinated ethenes and ethanes (breakdown products of common degreasing solvents) in the groundwater were also used to confirm the extent of the plume.

A groundwater monitoring network was established from this system and used as part of monitoring for the Final Remedy and to satisfy post-closure monitoring requirements under MFS. The following discussion summarizes the results of 10 years of groundwater monitoring at Midway Landfill. Of the COCs identified during the RI, only manganese and two VOCs remain greater than their cleanup levels. (Section 4 contains information on development of chemicals of concern and their cleanup levels.) The two VOCs are 1,2-dichloroethane (1,2-DCA) and vinyl chloride (VC).

Upper Gravel Aquifer

The monitoring network in the UGA includes two upgradient and two downgradient wells. Water levels and water quality in the upgradient wells has remained fairly constant over the decade. Upgradient well MW-21A contains elevated chloride, COD, and conductivity relative to the second upgradient well (MW-16), but neither exceeds cleanup levels. Downgradient wells MW-7A and

MW-19B contained elevated concentrations for many constituents before the construction of the Final Remedy. Shortly after the initial grading and installation of the preliminary landfill gas system, water quality in the UGA began improving; by completion of the remedy, wells in the UGA were dry. VC has never been detected in the UGA; 1,2-DCA was detected once (in MW-7A in Round QM-4 at its detection limit of 1 μg/L).

The Sand Aquifer

The monitoring network in the SA included four upgradient wells (MW-8B, MW-30B, MW-17B, and MW-21B) and three downgradient wells (MW-15A, MW-20A, and MW-23A). The upgradient wells MW-17B and MW-21A are contaminated with chlorinated solvents that are the parent chemicals to the volatile COCs at Midway Landfill; that is, these solvents are actively degrading in the groundwater system to produce other chlorinated volatile organic chemicals including the two volatile COCs. Contamination in MW-17B has remained fairly constant over the last decade, and remains the most contaminated well in the study area. Contamination at MW-21B has been increasing slightly over the last several years. MW-20A is downgradient of the upgradient source area and located at the beginning of the historical discharge from the UGA; hence its water quality is affected by both the landfill and the upgradient source area.

MW-30B was originally installed as a downgradient well, but the potentiometric surface showed that it was actually upgradient of the landfill on the far side of the groundwater sink formed by SA groundwater discharging into the SGA. The well has consistently been clean, and has recently been deleted from the groundwater monitoring network with Ecology and Department of Public Health approval.

Downgradient wells MW-15A and MW-23A had historical exceedances of 1,2-DCA and VC, although neither had concentrations as high as the upgradient well MW-17B. MW-20A had detected concentrations of 1,2-DCA that were intermediate between the two and occasionally in exceedance of the cleanup level. Historically, these wells also contained manganese above background. Beginning in approximately 1992 (shortly after the completion of the Final Remedy), contaminant levels began falling in the downgradient wells, followed by the wells going dry. Downgradient wells MW-15A and MW-23A were in compliance for volatile organic chemicals before they went dry. MW-20A has been consistently dry since 1994; MW-23A occasionally contains sufficient water to collect water levels, but insufficient water for purging and sampling; MW-15A is dry during some rounds and contains sufficient water to sample in others. Concentrations of 1,2-DCA in MW-15A have remained less than the cleanup level since 1993; vinyl chloride has been undetectable. Manganese concentrations in MW-15A are now less than background concentrations as well.

In summary, downgradient water levels in the SA decreased adjacent to the landfill following construction of the Final Remedy. The two SA wells that are within the footprint of the landfill have been dry since 1994. Before they went dry, their water quality was improving. The two downgradient wells further from the landfill are often dry; when there has been sufficient water to sample, they have been in compliance for volatile COCs. MW-15A, the downgradient well in the SA for which the most sampling data exists, has been in compliance for volatile COCs since 1993, and for manganese since 1997. The decrease in water levels and improvements in water quality are believed to be a direct result of the Final Remedy at Midway Landfill.

The Southern Gravel Aquifer

The monitoring network in the SGA consists of one upgradient well (MW-24B) and five downgradient wells (MW-14B, MW-20B, MW-23B, MW-29B, and MW-30C).

The volatile COCs historically exceeded cleanup levels in MW-14B, MW-23B, and MW-29B; they were never detected in downgradient wells MW-20B (to the west) or MW-30C (to the far east). Levels have been decreasing in MW-14B since approximately 1994, and are now less than the detection limits. Since MW-14B is located where SA groundwater discharges into the SGA, and since the SA has been in compliance since 1994, this is interpreted as the beginnings of a "clean front" moving into the SGA. This is reflected in decreasing concentrations of both volatile COCs, and in decreasing landfill leachate parameters such as chloride.

Concentrations in MW-23B are also improving, but at a much slower rate. This well has consistently shown less landfill leachate impact, as measured by chloride, manganese, and other landfill indicators, than either MW-20B or MW-14B. These indicators are decreasing in MW-23B at a faster rate than the chlorinated solvents, and this well may be more affected by the chlorinated solvents coming from the upgradient source area.

Concentrations are remaining constant in MW-29B. This is the furthest well from the landfill that is contaminated, and the lack of improvement in water quality may be due to the long travel times required to reach this well. It will continue to be monitored in the future.

Background manganese concentrations are high in the SGA and in the related Northern Gravel Aquifer, with regional background concentration at 1.1 mg/L. MW-24B, MW-23B, MW-29B, and MW-30C all have manganese concentrations at or below background; and manganese concentrations in MW-14B have been decreasing rapidly over the last few years as a "clean front" of less contaminated groundwater enters the SGA. Manganese concentrations in MW-20B are above background and increasing and will be monitored closely over the next few years.

In summary, the two volatile COCs exceed cleanup levels in MW-23B and MW-29B, but are not detected in recent rounds in MW-14B located at the point of compliance. Manganese concentrations exceed background in MW-14B and MW-20B, but are decreasing rapidly toward background in MW-14B.

3.4 UPGRADIENT AND REGIONAL SOURCES OF CONTAMINATION

In 1990, Ecology contracted with Science Applications International Corporation (SAIC) to perform a site hazard assessment and hazardous substance review of industrial activities in the Midway Landfill vicinity in order to identify potential sources of the groundwater contamination detected upgradient of the Midway Landfill during the RI. SAIC identified several potential sources for the chlorinated ethenes and ethanes (specifically 1,1-dichloroethane; 1,1-dichloroethene; 1,2-dichloroethane; and 1,1,1-trichloroethane) northwest and upgradient of the landfill, in the vicinity of Pacific Highway South and South 248th Street.

Twenty surface soil samples from 17 businesses and properties were taken in May 1991 and analyzed for VOCs at the National Environmental Testing Laboratory in San Diego, California. Of the 20 samples, six contained detectable levels of tetrachloroethene (the parent compound

for many of the other ethenes and ethanes). The sample taken from N.W. Powder at 24453 Pacific Highway South contained 75,000 µg/Kg tetrachloroethene and 12,000 µg/Kg 1,1,1-trichloroethane. The MTCA Method A cleanup levels for those chemicals are 500 and 20,000 µg/Kg, respectively (SAIC, 1991).

The SAIC report also noted that C-Dory Boat Manufacturing, located at 25028 Pacific Highway South, denied Ecology access to their property. SAIC had selected C-Dory for sampling based on the chemicals potentially used in its operations, such as 1,2-DCA (SAIC, 1991).

In October 1998, Vista Information Solutions, Inc. (Vista) performed a review of existing regulatory databases of businesses within 1.5 miles of the Midway Landfill and found no fewer than 20 locations within ¾-mile of the landfill with known chemical releases into the soil and, in some cases, underlying groundwater. Most of those releases were from diesel, gasoline, or waste oil underground storage tanks (USTs). In addition to N.W. Powder's release of chlorinated solvents, Vista identified the release of halogenated organics, metal cyanides, metals at two Davis Construction Co. properties: 24515 – 26th Place South and South 244th and 26th Place South. These properties are located in the area of the upgradient contamination.

Vista also reported fifteen leaky USTs in the vicinity of the landfill, which leaked into the soil and, in some cases, the underlying groundwater. However Vista did not report the contents of those tanks. Several additional facilities generate RCRA materials, including chlorinated solvents. The Vista and SAIC reports are included in Appendix A.

3.5 GROUNDWATER USE

As part of the Midway Landfill Environmental Impact Survey (EIS) in 1985, Parametrix located private wells within a one-mile radius of the landfill, and public wells within five miles of the landfill by reviewing agency files from the following sources:

- Seattle-King County Department of Public Health
- Washington State Department of Ecology
- Washington State Department of Public Health
- Well Inventory Tables compiled in the Groundwater Resources of Southwestern King County (Luzier, 1969)

Based on this inventory, Parametrix sent questionnaires to approximately 90 households near the landfill in order to verify the existence and use of private wells. The list of households was updated during the RI, and several key downgradient wells were re-verified in 1999. Citizens were also questioned at several public meetings and at meetings of the Midway Action Group regarding their knowledge of any wells in neighborhoods surrounding the landfill.

From this information, 31 private wells were identified within a one-mile radius of the landfill. The locations of these wells, in addition to three public wells, are shown in Figure 3.13. Of the 31 wells, nine are in use, 12 are unused, and 10 are inoperable. Of the nine wells being used, five are used for drinking water, including the Lake Fenwick supply, which services nine homes, and the other four wells are used for irrigation. The five drinking-water wells (Well Nos. 1, 2, 3, 5, and 6) are all located over 4,600 feet from the landfill, in the Lake Fenwick area. Three of the

four irrigation wells (Well Nos. 19, 31D, and 54) are located over 2,000 feet southwest of the landfill (out of the plume path). The fourth irrigation well (Well No. 13) is located between the groundwater plume and the Lake Fenwick wells.

Monitoring Well MW-30 was added in 1988 to act as an early warning location should any measurable contamination from the landfill move toward Irrigation Well 13 or toward the Lake Fenwick wells. MW-30 is still monitored, and has remained clean and unimpacted throughout the groundwater monitoring program.

Two wells were identified within 1,000 feet of the landfill (Well Nos. 37 and 57). Well No. 57 is dry and owned by the City of Kent, Well No. 37 is unused and covered.

Because the Lake Fenwick wells are used for domestic water, they represent the only known points at which contact with potentially affected water is remotely possible. However, exposure via these wells is considered highly unlikely for the following reasons:

- The plume is moving in an east by northeasterly direction, and therefore will pass to the north of the Lake Fenwick area (AGI, 1990a).
- The COCs are degrading and are unlikely to persist over the travel times and distances that would be necessary for them to reach the Lake Fenwick wells (AGI, 1990a).
- All hydrologic information suggests that the Lake Fenwick wells are not completed in an aquifer that is hydraulically connected to the SGA (AGI, 1988).

There are three public wells in the Midway Landfill area. Two are operated by the Highline Water District near the two intersections of South 209th Street and 31st Avenue South, and South 208th Street and 12th Avenue South, respectively. These two wells are screened in the second confined aquifer, at over 120 feet below sea level. Both are over two miles north and northwest from the landfill in an area that is upgradient of the landfill, and are completed in aquifers that are not connected to the affected aquifers. The third well is operated by the Kent Water District at South 212th Street and Valley Freeway and is used to satisfy peak summer demands. None of these municipal wells draw water from affected aquifers, and all are more distant from the landfill than are the Lake Fenwick wells (Parametrix, 1988a).

Finally, neither water district has future plans to develop groundwater supplies from any aquifers within a one-mile radius of the Midway Landfill. The wellhead protection areas delineated by these utilities do not include the Midway Landfill site.

4.0 Chemicals of Concern, Cleanup Levels, and Point of Compliance

4.1 INTRODUCTION

The purpose of this section is to develop and present chemicals of concern, cleanup levels and point of compliance for groundwater at Midway Landfill. This proposal is made based on careful consideration of the following documents:

- The Model Toxics Control Act Cleanup Regulation, Chapter 173-340 WAC. Washington State Department of Ecology, amended February 1991.
- Model Toxics Control Act Cleanup Levels and Risk Calculation (CLARC II) Update. Washington State Department of Ecology, August 13, 1994.
- Statistical Guidance for Ecology Site Managers. Washington State Department of Ecology, Toxics Cleanup Program, August 1992.
- USEPA Interim Final Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), Section 5.9.3. United States Environmental Protection Agency
- Midway Landfill Feasibility Study: Groundwater, Surface Water, Seeps, and Soils Pathways. Prepared for City of Seattle by Parametrix Inc., December 1990.
- Endangerment Assessment for Midway Landfill (EA). Prepared for Parametrix, Inc., by ICF Technology, Inc., et al., December 1990.
- Quarterly Monitoring Reports. Prepared for Seattle Solid Waste Utility Division of Seattle Engineering Department by Parametrix, Inc. and AGI Technologies for years 1990 through 1998.
- Midway Landfill Groundwater Remediation Status Report. Prepared for City of Seattle by Parametrix, Inc., et al., May 1994.

4.2 CHEMICALS OF CONCERN AND CLEANUP LEVELS

The Endangerment Assessment (EA) identified organic and inorganic chemicals in groundwater at Midway Landfill that could potentially pose a risk to human health and evaluated that risk. Because the contamination exists over 100 feet below ground surface and does not reach surface water receptors at measurable concentrations, no current or future potential exposure to ecological receptors was found. Consequently, the only exposure considered for groundwater at Midway Landfill was potential exposure to humans via consumption and household use of groundwater.

The nearest current exposure was potentially at the Lake Fenwick wells. No detectable level of contamination was ever found at these wells; consequently, modeled concentrations were used to estimate the maximum risk at these wells, using very conservative assumptions. The estimated cancer risk was less than 1.0×10^{-7} and the hazard index was less than 0.001.

4.2.1 Identification of Chemicals of Concern (COCs)

The selection of COCs in the EA predated both Risk Assessment Guidance for Superfund (RAGS) and Ecology's Statistical Guidance for Project Managers. Because there was no clear guidance for eliminating COCs at the time the EA was performed, the EA retained inorganic chemicals that were clearly at background and retained laboratory contaminants. This resulted in an overestimation of the risk and retention of inappropriate chemicals. For this reason, the COC list has been refined using procedures in RAGS and the additional data from the FS and quarterly monitoring.

Metals

Metals were compared to natural background concentrations based on data gathered from numerous upgradient wells in the Midway study area that are clean and represent regional conditions in glacial aquifers in Puget Sound. This same background data is consistent with Kent Highlands Landfill area background wells and with additional data gathered by the United States Geological Survey (USGS) for glacial formations in south King County. The following metals were eliminated from the COCs based on this background comparison: cadmium, chromium, copper, selenium, and zinc. Arsenic, lead, and boron have also been eliminated based on background comparison. These metals were all within background ranges in the SA and SGA; their only exceedances of this range were in the UGA in wells that have been too dry to sample since the construction of the Final Remedy. The only metal retained as a COC for Midway Landfill is manganese.

Organic Chemicals

Method B was used to screen the organic chemicals to identify those that are appropriate for further evaluation. The following chemicals were listed as COCs in the EA, but have been eliminated because they have not been detected in downgradient wells in 32 rounds of quarterly monitoring and/or their maximum detection in groundwater was significantly less than Ecology's Method B Cleanup criteria:

Volatile Organics	Semivolatile Organics
Acetone	Chlorobenzene
Chloroethane	PCBs (never detected in groundwater)
1,1-Dichloroethane	PAHs (never detected in groundwater)
1,2-Dichloroethene	
Ethylbenzene	
Methyl ethyl ketone	
Methyl isobutyl ketone	
Tetrachloroethene	
Toluene	
1,1,1-Trichloroethane	
1,1,2-Trichloroethane	
Trichloroethene	
Xylenes	

Finally, 1,1-dichloroethene was listed in the EA as a COC by mistake. It should have been eliminated based on frequency of detection (USEPA, 1989), because it was not detected during the RI. It was detected in one downgradient well, one time only (in 1992), at an estimated concentration of 0.7 µg/L, with poor mass spectral identification.

Selected COCs

Based on the screening described above, the only COCs in groundwater for Midway Landfill are:

- **1,2-Dichloroethane (1,2-DCA).** 1,2-DCA is currently detected in three downgradient wells and one upgradient well at concentrations between 1.1 and 9.6 µg/L, with the highest concentration upgradient. (Parent compounds to 1,2-DCA also are detected in upgradient, but not downgradient wells.)
- **Vinyl chloride (VC).** VC is currently detected in one downgradient well at the current PQL of 2.0 µg/L. It has been detected in upgradient well MW-17B, and its parent compounds are also detected in both upgradient wells.
- **Manganese (Mn).** Mn is currently elevated above background in two downgradient SGA wells, MW-20B and MW-14B. MW-14B is currently trending toward background. Mn also appears to exceed background in the upgradient well MW-21B.

4.2.2 Development of Cleanup Levels and Remedial Action Levels

Manganese

Setting a cleanup level for manganese is problematic from a technical point of view. Manganese is detected at high concentrations throughout the SA and SGA due to natural conditions, and is elevated downgradient of the landfill because of its dissolution from the native formation. That is manganese is not "coming" from the landfill, rather the manganese is dissolving from the native soils as anaerobic groundwater passes through the area. Decreasing the production of leachate, which is very anaerobic, results in decreased manganese dissolution, but returning the downgradient manganese concentrations to regional background requires precipitation of the manganese. This in turn requires a source of oxygen to the deep aquifers. The major source is "clean" infiltrating rainwater, a source that takes years to reach the SA and SGA. Even when this occurs, these aquifers will be unusable for drinking water without manganese removal because of naturally high concentrations in the aquifers.

The situation at Midway Landfill is further complicated by the location of the manganese exceedances. Manganese concentrations exceed background in MW-20B and MW-14B. Both wells are located in the SGA at the site boundary. Manganese concentrations in SGA wells further downgradient of the landfill are less than background and in compliance. MW-14B, which received recharge from the SA from east of the landfill, is trending toward background. The rate at which oxygen can reach these wells (which will result in the precipitation of the manganese) is limited by the operation of the landfill gas extraction system and the vacuum that it produces beneath the landfill.

For these reasons, Ecology has determined that setting both a cleanup level and a remedial action level for manganese is appropriate. The cleanup level for manganese will be the regional background in the SA and SGA. This regional background was established in the Remedial Investigation for Kent Highlands Landfill (CH2M-Hill, 1991), and varies from 0.40 in the SA to 1.1 mg/L in the deeper gravel outwash aquifers, such as the SGA.

The remedial action level will be defined as follows:

- No further remedial action will be necessary to address manganese concentrations in groundwater as long as the manganese concentrations do not trend upward over time. If concentrations are found to trend upwards over time, but only in locations adjacent to the landfill that are under control of the gas extraction system, then no further action will be necessary.

Organic Chemicals

The City is proposing that Method C be used for establishing cleanup levels for this site. Method C is a conditional method and is used when Method A or Method B may be technically unfeasible. Method B and Method C cleanup levels for the COCs have been developed by Ecology and published in the CLARC II database; they are shown in Table 1.

Following Ecology's *Statistical Guidance for Ecology Site Managers* (Ecology, 1992), the following considerations are justification for the use of the method:

- Cleanup levels under Method B are less than upgradient concentrations for the two volatile COCs, which are present in an upgradient source area around MW-17 (west of Pacific Highway South).
- Cleanup levels under Method B are less than practical quantitation levels (PQLs) for one of the COCs, VC, based on PQLs contained in Implementation Memo #3 from Steve Robb of Ecology (Ecology, 1993).
- Obtaining Method B cleanup levels may be technically unfeasible at this site because remediation of the landfill will not affect the upgradient source west of Pacific Highway South. This upgradient source will continue to supply the parent compounds of the two volatile COCs that are driving the downgradient risk.

Upgradient Sources Concentrations

As discussed in Section 3, an upgradient source area exists along Pacific Highway South, with maximum upgradient concentrations located in the SA at MW-17B and MW-21B. Groundwater at MW-17B is contaminated by the chlorinated solvent trichloroethane and its degradation products, specifically:

- 1,1,1-TCA, maximum concentration of 34 µg/L,
- 1,1-dichloroethane, maximum concentration of 290 µg/L,
- 1,2-dichloroethane (1,2-DCA), maximum concentration of 20 µg/L,
- chloroethane, maximum concentration of 36 µg/L, and
- VC, maximum concentration of 2.3 µg/L.

Groundwater contamination at MW-21B is dominated by the chlorinated solvent tetrachloroethene (or PERC) and is degradation products, specifically:

- tetrachloroethene, maximum concentration of 35 µg/L and
- trichlororethene, maximum concentration of 3 µg/L.

Both of these sources produce VC, and the source at MW-17B produces 1,2-DCA. Source concentrations (parents plus degradation products) are significantly higher at MW-17B than concentrations detected in landfill leachate, in the UGA, or in wells downgradient of the landfill.

Establishment of PQLs for Vinyl Chloride

The Method B and C levels for VC are less than the PQL for VC using EPA Method 8010, which is lower than those for EPA Method 8240. The current PQL in groundwater for VC is 2 µg/L; this value is shown in Table 1 and is taken from Implementation Memo No. 3.

Technical Limitations to Obtaining Groundwater Cleanup Levels

There is a fundamental technical limitation to obtaining Method B cleanup levels at Midway Landfill – the fact that landfill remediation will not affect the upgradient source concentrations. Upgradient concentrations of chlorinated solvents have increased over the last decade; at the same time that remedial action was dewatering the landfill and resulting in significant improvements in the two upper aquifers beneath the site. The landfill remediation does not and cannot affect the upgradient source, and downgradient concentrations in the SGA in the future may continue to exceed Method B levels solely due to the upgradient source area.

Cleanup Levels for Organic Chemicals

Ecology has established the following cleanup levels for the COCs in groundwater at Midway Landfill; these levels are listed in Table 1:

- **1,2-Dichloroethane:** 4.8 µg/L. This is the Method C level, and slightly less than the MCL of 5.0 µg/L.
- **Vinyl Chloride:** 0.2 µg/L. This is the Method C level, is less than Ecology's PQL of 2.0 µg/L (which may result in inaccurate quantitation) and the MCL of 2.0 µg/L. Compliance will be established based on the PQL available at the time of monitoring, as long as the PQL is less than or equal to Ecology's current PQL of 2.0 µg/L.

The cleanup levels for 1,2-DCA and VC are exceeded in two downgradient wells in the SGA. Although these wells contain chemicals exceeding the cleanup level, there is no actual risk at Midway Landfill because there are no drinking water wells completed in the affected areas, and thus, there is no potential contact with the affected groundwater. Groundwater use restrictions (discussed in Section 5) will prevent any such contact in the future.

These proposed cleanup levels satisfy other chemical-specific ARARs, including the state and federal drinking water standards (maximum contaminant level).

Finally, because of the success of the remedial action in bringing the UGA and SA into compliance and because of the continued existence of the upgradient source area, Ecology has determined that it is appropriate to set remedial action levels for 1,2-DCA and VC as follows:

As long as the UGA and SA downgradient of Midway Landfill remain in compliance with the cleanup standards, then no further remedial action at Midway Landfill will be necessary to address 1,2-DCA and VC concentrations in the groundwater in the SGA.

If concentrations of volatile organics in the UGA and SA are found to exceed cleanup standards at some point in the future, then the changing conditions will be evaluated with respect to both landfill operations and maintenance and the nature and extent of contamination in the upgradient source area.

4.3 POINT OF COMPLIANCE

Cleanup standards consist of cleanup levels and the point of compliance where they must be met (WAC 173-340-700); hence it is necessary to establish a point of compliance for COCs in groundwater at Midway Landfill. Since the Midway Landfill is a solid waste landfill, its point of compliance (POC) is determined by the state's Minimum Functional Standards for Solid Waste Handling (WAC 173-304-100 and -58) as "the perimeter of a solid waste facility's active area as that active area would exist at the closure of the facility." This definition is consistent with the MTCA designation of a "conditional POC" as the site boundary at sites where hazardous substances remain onsite as part of a cleanup action (WAC 173-340-720). For Midway Landfill, therefore, the POC is the perimeter of the site, except for the eastern edge where the refuse extends under the southbound lanes of I-5. In that area, the POC is the edge of refuse beneath I-5.

Groundwater compliance monitoring at the boundary of refuse at Midway Landfill is complicated by the following:

- The eastern (and downgradient) edge of landfill refuse lies beneath the I-5 corridor. This has forced the placement to monitoring wells to either side of I-5. Those on the western edge are actually within the site and slightly upgradient of the point of compliance; those on the eastern edge are slightly downgradient of the point of compliance. Both locations are considered acceptable for monitoring the point of compliance.
- Many of the wells completed in the uppermost two aquifers beneath the landfill are now dry as a consequence of the dewatering of the landfill, which occurred as part of the Final Remedy. The groundwater monitoring program will continue to monitor these dry wells in the UGA and SA with the lack of water in these wells considered acceptable performance.

4.4 TIME OF COMPLIANCE

Midway Landfill is currently in compliance in the two upper aquifers beneath the site. Compliance with cleanup levels required approximately 5 years to achieve, and was largely a function of dewatering of the landfill combined with gas extraction, followed by the slow migration of the resultant "clean front" from the UGA into the SA.

It is unknown when the SGA will comply with cleanup levels, since contamination from the upgradient source area continues. However, contamination in the SGA is limited two volatile

organics: 1,2-DCA and VC, and manganese. Both organics are known to undergo both aerobic and anaerobic degradation; therefore, the contamination is expected to degrade over time.

Manganese concentrations are exceeded in the two SGA wells that are at the property boundary. Wells further downgradient in the SGA are in compliance for manganese. Continued operation of the landfill gas system, and its creation of a strong vacuum beneath the landfill is acting to keep oxygen from this area, which is, in turn, keeping these wells from coming into compliance. This is considered to be acceptable.

4.5 SUMMARY

Two volatile organics chemicals, 1,2-DCA and VC, and manganese are chemicals of concern for groundwater at Midway Landfill. Before implementation of the Final Remedy for Midway Landfill, these chemicals were greater than cleanup levels in a series of downgradient wells and in an upgradient source area centered around MW-17B. Since implementation of the final remedy, concentrations of chlorinated solvents in the upgradient area have remained fairly constant, while concentrations downgradient of the landfill have decreased significantly.

Beginning with the final grading of the site and installation of the initial gas extraction system, downgradient groundwater conditions improved. The monitoring wells in the UGA (located at the base of the unit where it discharged into the SA) were in compliance for organic VOCs within a year of the initiation of the final remedy. By final construction in 1992, these wells had gone dry due to the significantly decreased discharge of leachate from the landfill. Within a year of the UGA compliance monitoring wells going dry, the compliance monitoring wells in the underlying SA were showing rapid decreases in volatile organics – MW-15A and MW-23A were in compliance by 1993, while MW-20A was trending downward. Shortly thereafter, as discharge from the landfill continued to decrease, these monitoring wells in the SA also went dry. During the last few years with above average precipitation, water has returned to MW-15A and MW-23A, although only MW-15A had sufficient water to sample. Concentrations in MW-15A, when there is sufficient water to sample, indicate that groundwater in the area is in compliance with the cleanup levels.

As the water levels in the SA dropped, so did the water levels in the underlying SGA. Water levels in the SGA directly beneath the landfill are now almost 10 feet lower than during pre-remedial conditions. Additionally, volatile COCs are no longer detected in MW-14B where groundwater from the SA nearest the landfill discharges into the SGA. Water quality in MW-23B may be slowly improving; concentrations at MW-29B are similar to historical concentrations.

Water levels in the SA and SGA now appear to be under regional control, with increases and decreases generally following seasonal rainfall patterns (e.g., lower levels after dry years, and higher levels with wet years). Additional improvements in the water quality appear limited by the unchanged condition of the upgradient source and by the relatively slow travel times in the SGA.

Under current conditions, the following exceedances of cleanup levels remain:

- Manganese exceeds background in two SGA wells located at the site boundary; wells further downgradient have concentrations at or below background. Manganese concentrations at these two wells may continue to exceed background because the continued operation of the landfill gas system limits the amount of oxygen that can

reach this area and oxygen is necessary to return these wells to background concentrations. This situation is considered acceptable since continued operation of the landfill gas system is considered highly desirable.

- VC is currently detected in a single downgradient well (MW-23B in the SGA) at its PQL of 2.0 µg/L. This is greater than the proposed cleanup level of 0.2 µg/L.
- 1,2-DCA is currently detected in the upgradient source area and in three downgradient wells. The source area has the highest concentration at 9.6 µg/L, the SA well, MW-15A, has the lowest at 1.1 µg/L, which is less than the cleanup level. MW-23B and MW-29B have concentrations that have been hovering around 6 µg/L for several years. The proposed cleanup level is 4.8 µg/L.

5.0 Selection of Cleanup Action for Offsite Groundwater

5.1 DESCRIPTION OF PROPOSED CLEANUP ACTION

Ten years of monitoring and performance data at Midway Landfill have shown the Final Remedy to be effective in controlling leachate and chemical migration into the groundwater system. Therefore, the selected groundwater action includes no new engineering controls or remedial measures beyond those affected as part of the final onsite remedy. Consistent with the findings of the 1990 Consent Decree and the FS, any such additional activities would be contingent upon the results of the Remedial Investigation (i.e., the discovery of new contamination) and/or the demonstration of the effectiveness of the final remedy (i.e., in reducing landfill leachate impacts to the groundwater). No new contamination has been discovered, and the monitoring history of the landfill demonstrates the effectiveness of the Final Remedy; therefore, the proposed cleanup action at the landfill is limited to three components:

- Institutional controls regarding potential groundwater use.
- Continued monitoring of offsite groundwater quality.
- Transfer of the supervision of future monitoring and maintenance activities to the Seattle-King County Department of Public Health.

These components are further discussed below.

5.1.1 Institutional Controls

Institutional controls pertaining to the landfill site have been implemented as part of the Final Remedy (discussed in Section 2.5) through the use of a Restrictive Covenant; therefore, institutional controls under the current proposal are limited to groundwater use downgradient of the landfill. The intent of the controls is to prevent the withdrawal of contaminated groundwater from the SA and SGA and its use as drinking water.

Currently, there are no known water supply wells in use that withdraw water from areas with groundwater contamination attributable to the Midway Landfill (Section 3.5). This situation will be maintained through the following actions:

- The City will notify the Seattle-King County Department of Public Health in writing of groundwater conditions in the affected area downgradient of the landfill, with inclusions of a map showing the location of the area and indicating which aquifers are affected and their elevations. This information will be updated annually as part of the City's groundwater monitoring program by submission of the Annual Report.
- The City will notify the Kent and Highline Water Districts in writing of groundwater conditions in the affected area downgradient of the landfill, with inclusions of a map showing the location of the area and indicating which aquifers are affected and their elevations.

- The City will notify Ecology in writing of groundwater conditions in the affected area downgradient of the landfill, with inclusions of a map showing the location of the area and indicating which aquifers are effected and their elevations.
- Ecology and Seattle-King County Department of Public Health will jointly issue a notice to all licensed, local well drillers reminding them that it is illegal to install a water supply well within 1,000 feet of a landfill (WAC 173-160), and that they are further prohibited from installing a water supply well within the affected area at Midway Landfill. This notice will include a map showing the affected area. This map will include both the upgradient and downgradient areas.

5.1.2 Monitoring

The 1990 Consent Decree for the Final Remedy requires the preparation of an Operations and Maintenance Manual. This manual has been accepted by Ecology as part of the Final Engineering Report; therefore, this material will not be duplicated as part of the current action. An Operations, Monitoring, and Maintenance Plan (OMMP) is also required under minimum function standards (WAC 173-304-407 (7)). This plan must include provisions for groundwater, surface water, and landfill gas monitoring, and maintenance of the facility and its structures. The City will submit an Addendum to the Operations and Maintenance Manual that compiles in one document the monitoring requirements that are already approved and in effect at Midway Landfill for landfill gas, surface water, and groundwater. With this addendum, the Operations and Maintenance Manual will satisfy the requirements for the OMMP under Minimum Function Standards.

Monitoring provisions under the CAP are intended to cover groundwater monitoring activities only, and to be consistent with provisions already negotiated and established with Ecology and the Department of Public Health. The details of this monitoring program are contained in the Compliance and Performance Monitoring Sampling and Analysis Plan" (Parametrix, 1999c)

Although the monitoring wells in the upper two aquifers beneath and along the perimeter of the landfill are now dry the majority of the time, the City has agreed to continue monitoring these wells to confirm conditions at the landfill and to provide data to Ecology and the Department of Public Health on groundwater concentrations associated with the upgradient source area. This monitoring will be done using the existing monitoring wells.

Further, the City will continue its monitoring program in the SGA.

5.1.3 Transfer to Department of Public Health

It is the intent of Ecology, Seattle-King County Department of Public Health, and the City to transfer the on-going oversight of Midway Landfill from the Ecology to the Department of Public Health. This is consistent with Ecology's determination of the following:

- That construction of the Final Remedy for Midway Landfill is complete.
- That all other actions pursuant to the 1990 CD are complete.

- That 10 years of monitoring and performance data have shown that the remedy is performing appropriately.
- That the remaining work to be performed by the City at Midway Landfill is normal, standard, and required parts of Landfill Closure Activities under WAC 173-304, and as such are appropriately overseen by the local health district.

Based on the above determinations, oversight of Midway Landfill will transition to Seattle-King County Department of Public Health January 1 of the year following the acceptance of the final CAP by Ecology.

5.2 CONSIDERATION OF OFFSITE SOURCES

Offsite groundwater contamination is a regional issue at Midway. Groundwater contamination is known to exist upgradient of the landfill spanning a distance of over 1,000 feet along Pacific Highway South (State 99), and from near surface to a depth of 250 feet below ground surface. Commercial and industrial facilities have operated in this area since at least the 1960s using septic systems until the mid-1980s. It is unknown how much of the contamination is historical and how much is on-going; however, contamination was found in 1988 during the RI to a depth of 250 feet in the vicinity of MW-17/10. This location is the most contaminated in the study area and its concentrations have remained constant over the last 10 years; indicating that significant contamination is likely historical, but may also include on-going inputs. Contamination at MW–21, on the other hand, is increasing, indicating that current inputs are almost certainly occurring.

The complexity of the interbedded glacial deposits along the topographic divide where these facilities are located would make control of groundwater contamination in this area very expensive and complex. Primary source control would need to be accomplished first. Remediation of historical subsurface contamination in the area would likely prove to be technically impracticable due to the complexity of the stratigraphy and the breadth and depth of the contamination. Finally, construction of upgradient source control or remediation, unrelated to the City's activities, is beyond the legal authority of the municipality of Seattle, and is inappropriate for the cleanup of Midway Landfill.

6.0 Justification for the Selected Offsite Groundwater Cleanup Action

The following justifications and determinations have been made with respect to the selected offsite groundwater cleanup action are based on the results of the RI, the FS, and the Final Remedy performance and compliance monitoring.

6.1 THRESHOLD REQUIREMENTS

The selected cleanup action for offsite groundwater meets the "Threshold requirements" set forth in WAC 173-340-360(2), as described below.

6.1.1 Overall Protection of Human Health and the Environment

The selected action is protective of human health and the environment. Downgradient groundwater contamination exceeding cleanup levels is confined to the SGA. No human or ecological receptors have been identified that make use of this groundwater resource within the contaminant plume. Institutional controls and ongoing monitoring will limit future exposures.

6.1.2 Compliance with Cleanup Standards

Post-remedial performance and compliance monitoring has demonstrated that closure and containment activities performed pursuant to the Final Remedy outlined in the 1990 Consent Decree have been effective in reducing Midway Landfill as an ongoing contaminant source to the regional aquifer beneath the site. The monitoring wells in the uppermost two aquifers below the site are now either dry or in compliance with cleanup levels when sufficient water exists to sample. The SGA, located beneath these two aquifers, contains two volatile chemicals, 1,2-DCA and VC, that exceed the cleanup standards downgradient of the landfill; they are now less than the detection limit (and the cleanup levels) in MW-14B at the point of compliance. The area defined by these downgradient exceedances receives groundwater from an upgradient source area that is still contaminated. Manganese exceeds background concentrations in two SGA wells at the point of compliance, wells further downgradient are at or below background.

6.1.3 Compliance with Applicable State and Federal Laws

The selected cleanup action for the offsite groundwater is consistent with both applicable state and federal laws and with those cleanup standards and criteria that have been determined to be relevant and appropriate to this action (ARARs). Specifically, the selected action will comply with cleanup levels as set forth under MTCA (WAC 173-340, including compliance with MCLs) and with post-closure monitoring requirements as set forth in Minimum Functional Standards for Solid Waste Landfills (WAC 173-304).

6.2 OTHER REQUIREMENTS

In addition to the threshold requirements set forth above, the selected cleanup action for offsite groundwater complies with the "Other requirements" set forth in WAC 173-340-360(3) as described below.

6.2.1 Use of a Permanent Solution to the Maximum Extent Practicable

The selected cleanup action for offsite groundwater employs, to the maximum extent practicable, a "permanent solution" pursuant to WAC 173-340-360(5)(b). It achieves cleanup standards without any further action being required, except with respect to those locations that are impacted by the upgradient source area. To the extent that the inability to meet cleanup standards at these locations is considered a non-permanent solution, the selected alternative can be considered with respect to the specific criteria set forth in WAC 173-340-360(5)(d), as follows:

Overall Protectiveness – The selected alternative is protective of human health and the environment, as discussed in Section 6.1.1 above.

Long-term Effectiveness – The landfill Operations and Maintenance Manual incorporates both long-term and short-term operation and maintenance requirements for the final remedial actions conducted pursuant to the 1990 Consent Decree. Compliance with this Operations and Maintenance Program ensures the continued containment of onsite wastes, the control of landfill gas and surface water, and the ongoing monitoring of offsite groundwater conditions. This program provides a high degree of certainty with respect to the long-term reliability, the low degree of residual risk, and the effectiveness of controls associated with the selected action.

Short-term Effectiveness – The selected remedy is protective of human health and the environment throughout its implementation. It presents no appreciable short-term risk because of the implementation of monitoring and institutional controls and the absence of any human or ecological receptors that could potentially be impacted by offsite groundwater in the SGA.

Reduction of Toxicity, Mobility, and Volume of Hazardous Substances – The final remedial measures implemented pursuant to the 1990 Consent Decree have been effective in eliminating the release of VOCs from Midway Landfill. The selected cleanup action for offsite groundwater includes continued monitoring of the effectiveness of the onsite remedial measures.

Implementability – The selected cleanup action can be implemented. It is technically possible, it is not dependent on the use of offsite facilities, it complies with applicable administrative and regulatory requirements, and it is integrated with the final remedial measures for the Midway Landfill established in the 1990 Consent Decree.

Cleanup Costs – The incremental cost of the selected action is not substantial and disproportionate to any incremental degree of protection it would achieve over a less preferable cleanup action.

Community Concerns – It is intended that community concerns regarding the selected cleanup action for offsite groundwater will be addressed through public review and comment on the draft CAP pursuant to WAC 173-340-600.

6.2.2 Provision of a Reasonable Restoration Time Frame

Cleanup standards have been achieved in the uppermost two aquifers below the site: the UGA and SA. Contamination greater than cleanup standards in the SGA likely derives from the upgradient source area. In the absence of such sources, which are both historical (subsurface) and current (operational), it is expected that concentrations of COCs in offsite groundwater either would already be in compliance or would naturally attenuate to levels less than cleanup standards within a reasonable time frame.

Potential risks to human health and the environment from offsite groundwater in the SGA are low, considering the current and potential future uses of the site, the surrounding area and associated resources, and the presumed effectiveness of institutional controls.

6.2.3 Consideration of Public Concerns

See Section 6.2.1 above.

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Tables

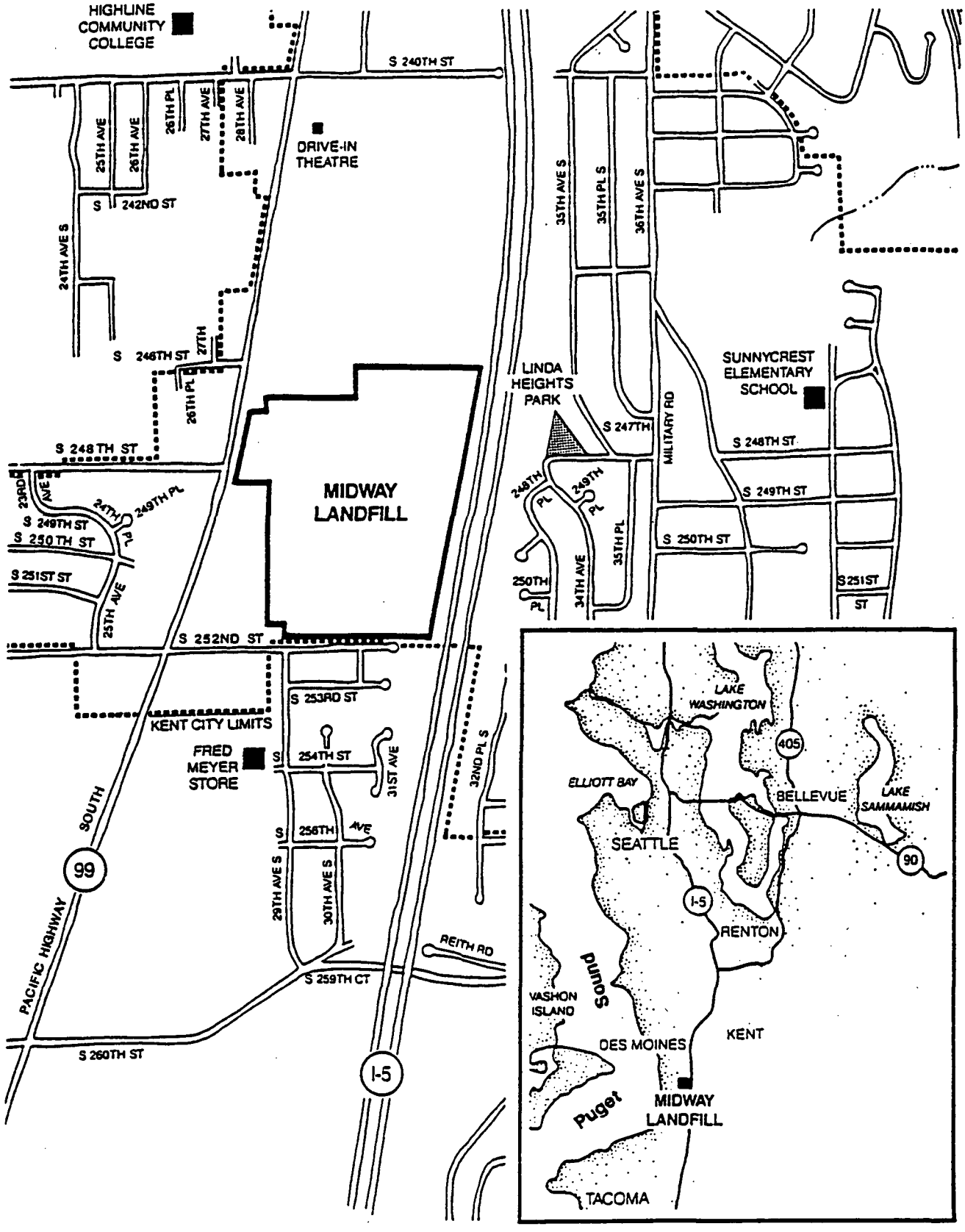
Table 4-1
Chemicals of Concern and Proposed Cleanup Levels

Analyte	Drinking Water MCL (WAC 246-2901)	MTCA Method A (WAC 173-340)	MTCA Method B (WAD 173-340)	MTCA Method C (WAC 173-340)	Area Background	Practical Quantitation Limit (method)	Selected Cleanup Level
1,2-Dichloroethane	5.00 µg/L	5.0 µg/L	0.48 µg/L	4.8 µg/L	19.4 µg/L	0.3 µg/L (8010)	4.8 µg/L (1)
Vinyl Chloride	2.00 µg/L	0.2 µg/L	0.023 µg/L	0.23 µg/L	2.3 µg/L	2.0 µg/L (8010)	0.2 µg/L (1)

Notes:

(1) Due to the upgradient source, it's possible that this cleanup level may never be obtained through remediation of the landfill.

Figures

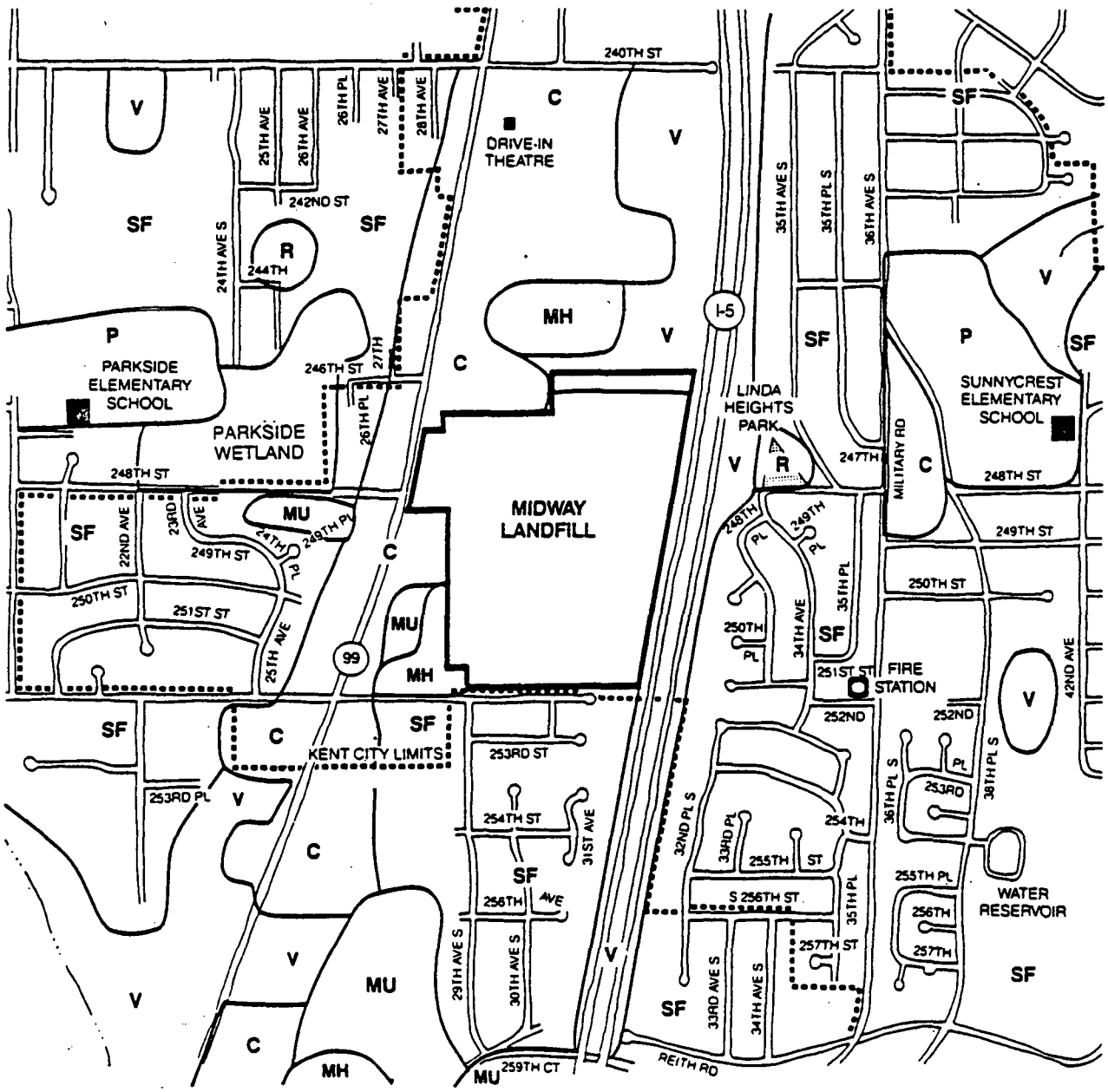


SCALE IN FEET

0 500 1,000

N

Figure 2-1.
Site Location Map
Midway Landfill
Kent, Washington



Source: Parametrix 1985.

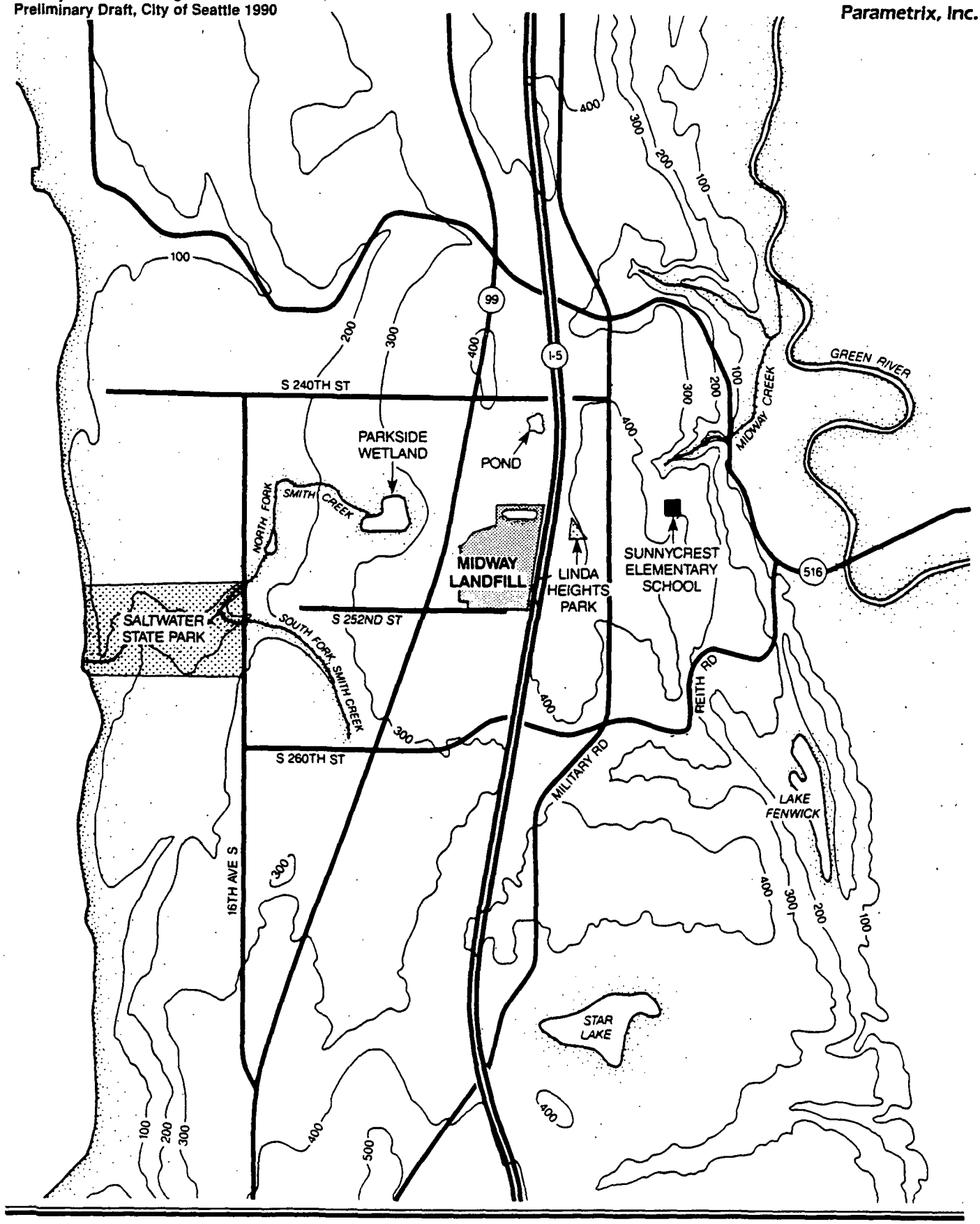
N

SCALE IN FEET

0 1,000 2,000

SF	Single Family Residential
MU	Multi-Unit Residential
MH	Mobile Home Residential
C	Commercial
P	Public
R	Parks and Recreation
V	Vacant

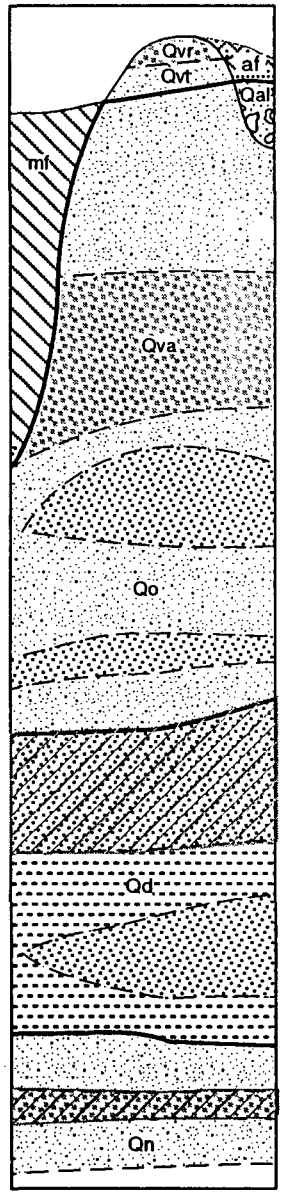
Figure 2-2.
General Land Use in Vicinity of Midway Landfill



SCALE IN FEET
0 1,500 3,000

N

Figure 2-3.
Regional Topography and Surface Water Bodies

BASE ELEVTION (feet)	STRATGRAPHIC SECTION	GEOLOGIC UNIT	HYDROSTRATIGRAPHIC UNIT
		FILL (af) Miscellaneous surficial fills. MIDWAY LANDFILL (mf) Municipal refuse and miscellaneous fills within the landfill boundary.	SHALLOW GROUNDWATER Seasonally shallow groundwater at base of fills. SATURATED REFUSE Saturated refuse at base of landfill.
		RECENT ALLUVIUM (Qal) Recent fluvial and lacustrine sediments including peat. VASHON RECESSIONAL OUTWASH (Qvr) Thin scattered deposits of well sorted sand and silty sand. VASHON TILL (Qvt) Thin scattered deposits consisting of compact silt, sand, and gravel glacial till. VASHON ADVANCE OUTWASH (Qva) Well sorted sand deposits with trace gravel.	SHALLOW GROUNDWATER Seasonally shallow groundwater at base of Recessional Outwash or in weathered Vason Till. Saturated thickness several inches to several feet. Shallow groundwater in Parkside Wetland in sandy portions of Recent Alluvium and in Outwash Gravels north of Landfill.
		OUTWASH GRAVELS (Qo) Oxidized silty sandy gravel, sandy gravel, and open work gravel with subordinate silt and sand lenses. Sand and silt proportions vary; gravel ranges from pebble to cobble size. Glacial outwash deposit.	UPPER GRAVEL AQUITARD Dense till-like mixture of silt, sand and gravel. UPPER GRAVEL AQUIFER Saturated highly permeable open work gravel and sandy gravel deposits associated with a buried channel at the base of Outwash Gravels.
190-250		DELTAIC SEDIMENTS (Qd) Interbedded fine grained sand, silty sand, sandy silt and silt. Occasional silty clay lenses, silty gravel channel deposits, and ash layers. Trace organic matter scattered throughout entire deposit. Sediments near base of deposit often have lavender cast from abundant hypersthene(?) crystals. Occasional dropstones. Possible glacio-lacustrine/deltaic deposits.	UPPER SILT AQUITARD Discontinuous layer of interbedded silt, clayey silt, and silty fine sand at the top of the Deltaic Sediments. Maximum thickness 55 feet; generally ranges between 15 and 35 feet thick. SAND AQUIFER 20 to 60 foot thick sand beds with intervening silt, clayey silt, and silty fine sand beds. LOWER SILT AQUITARD Discontinuous layer of interbedded silt, clayey silt, and silty fine sand at base of Deltaic Sediments: generally range from 1 to 5 feet thick where present.
80-150		NON-GLACIAL SEDIMENTS (Qn) Interbedded silty gravel, sandy gravel, silt, and silty sand. Silt and sand beds often have lavender cast. Wood fragments locally abundant. Tree encountered during drilling MW-29. Terrestrial non-glacial deposit.	NORTHERN GRAVEL AQUIFER Highly permeable 5 to 30 foot thick sandy gravel channel(?) deposits between elevation +30 and +80 feet. Potentiometric head greater than elevation +220. SOUTHERN GRAVEL AQUIFER Highly permeable 5 to 30 foot thick sandy gravel channel(?) deposits between elevation +50 and +110 feet. Potentiometric head less than elevation +175.

Midway Cap/55-1550-37(04) 6/99

Note: Shading indicates water bearing zone.

Figure 3-1.
Relationship of Geologic and Hydrostratigraphic Units Beneath the Midway Landfill

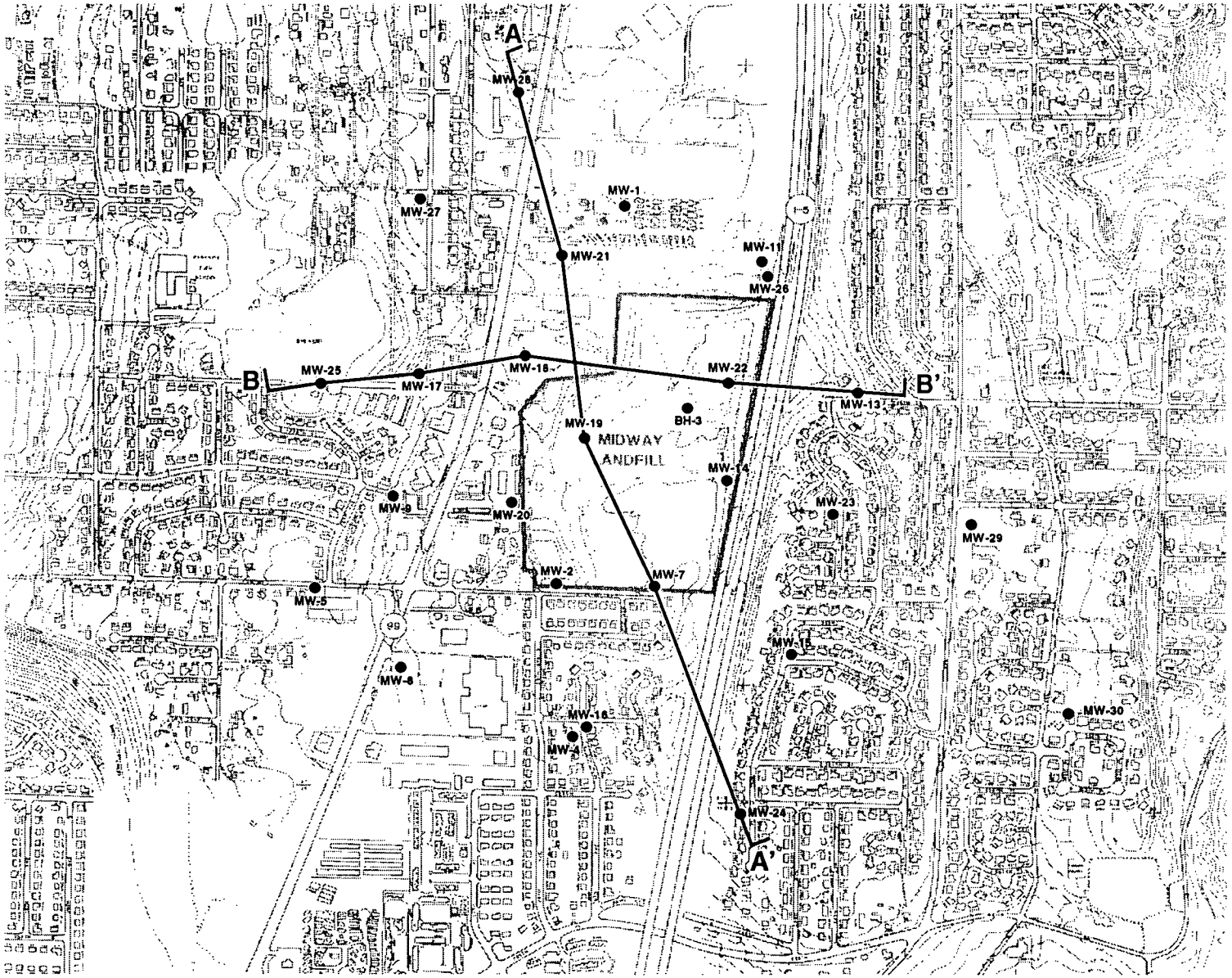
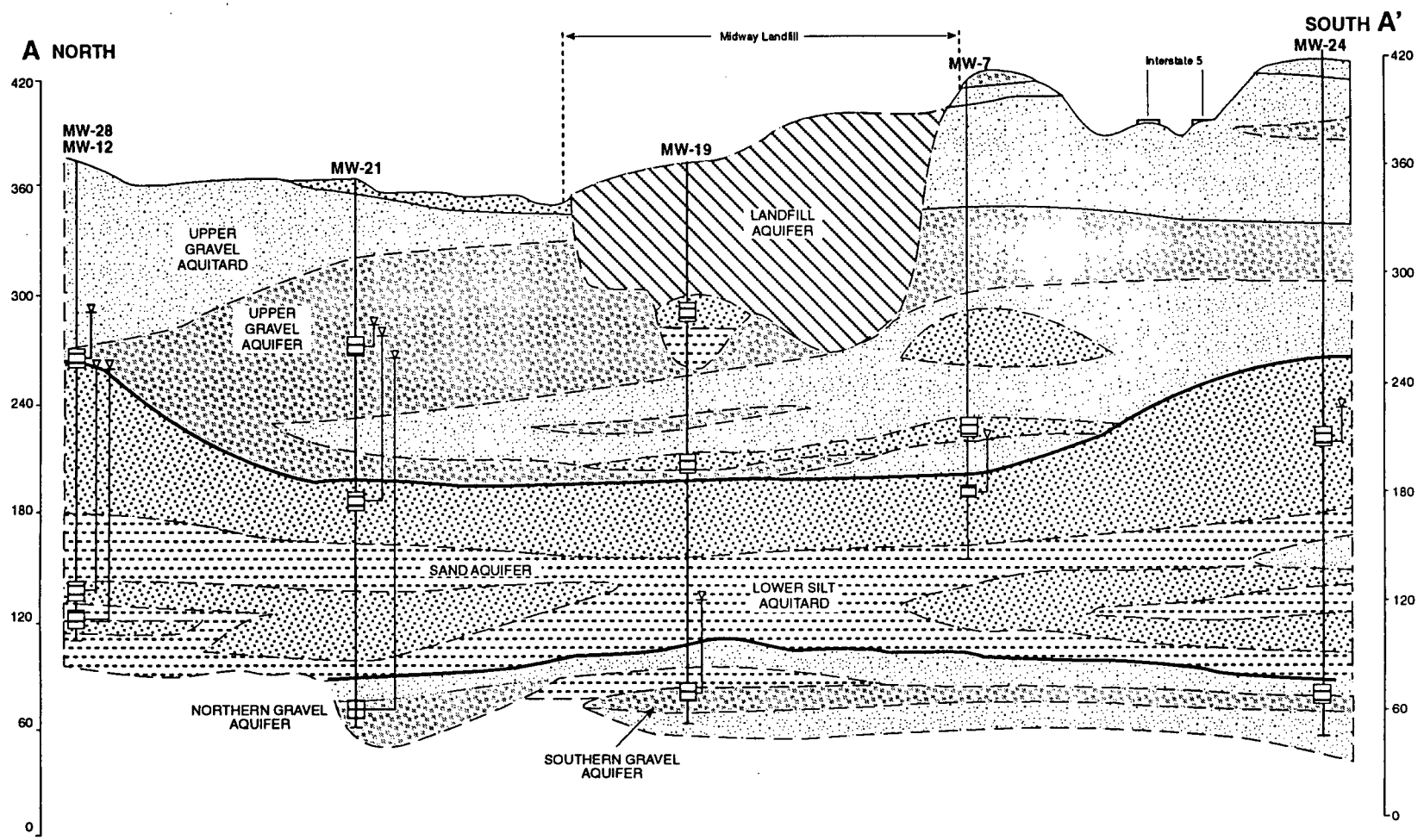


Figure 3-2.
Line of Geologic Section Map
Midway Landfill
Kent, Washington

Base Map Source:
Supplemental Hydrogeologic and Hydrochemical Investigation, AGI, 1990

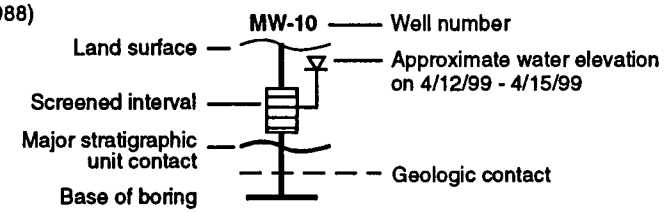
SCALE IN FEET
0 300 600
N

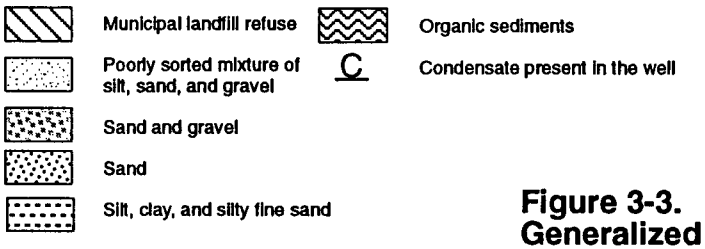
Midway/Cleanup Action Plan/55-1550-37(06) 6/99

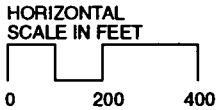


Midway Cap/55-1550-37(04) 6/99

Source:
Geology From AGI (1988)

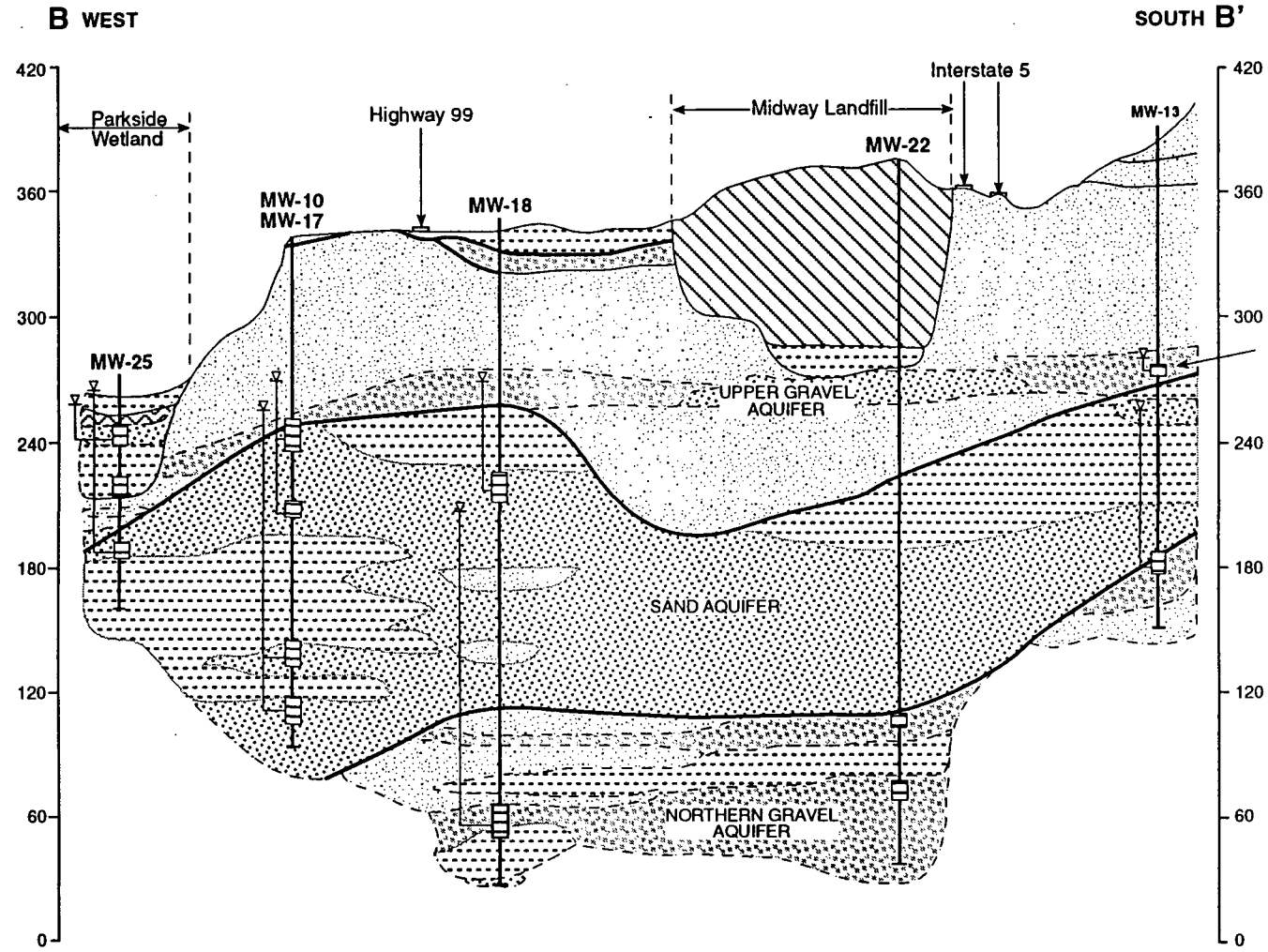






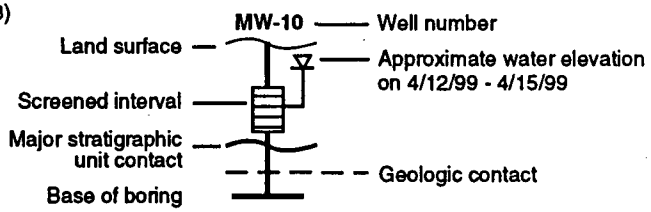
NOTES: This cross section is a diagrammatic interpretation of sub-surface conditions based on interpolation and extrapolation between borings. Geologic and hydrologic conditions are substantially more complex than depicted.

Figure 3-3.
Generalized North-South Cross Sectionof Monitoring Units
Midway Landfill
Kent, Washington



Midway Cap/55-1550-37(04) 6/99

Source:
Geology From AGI (1988)



LEGEND

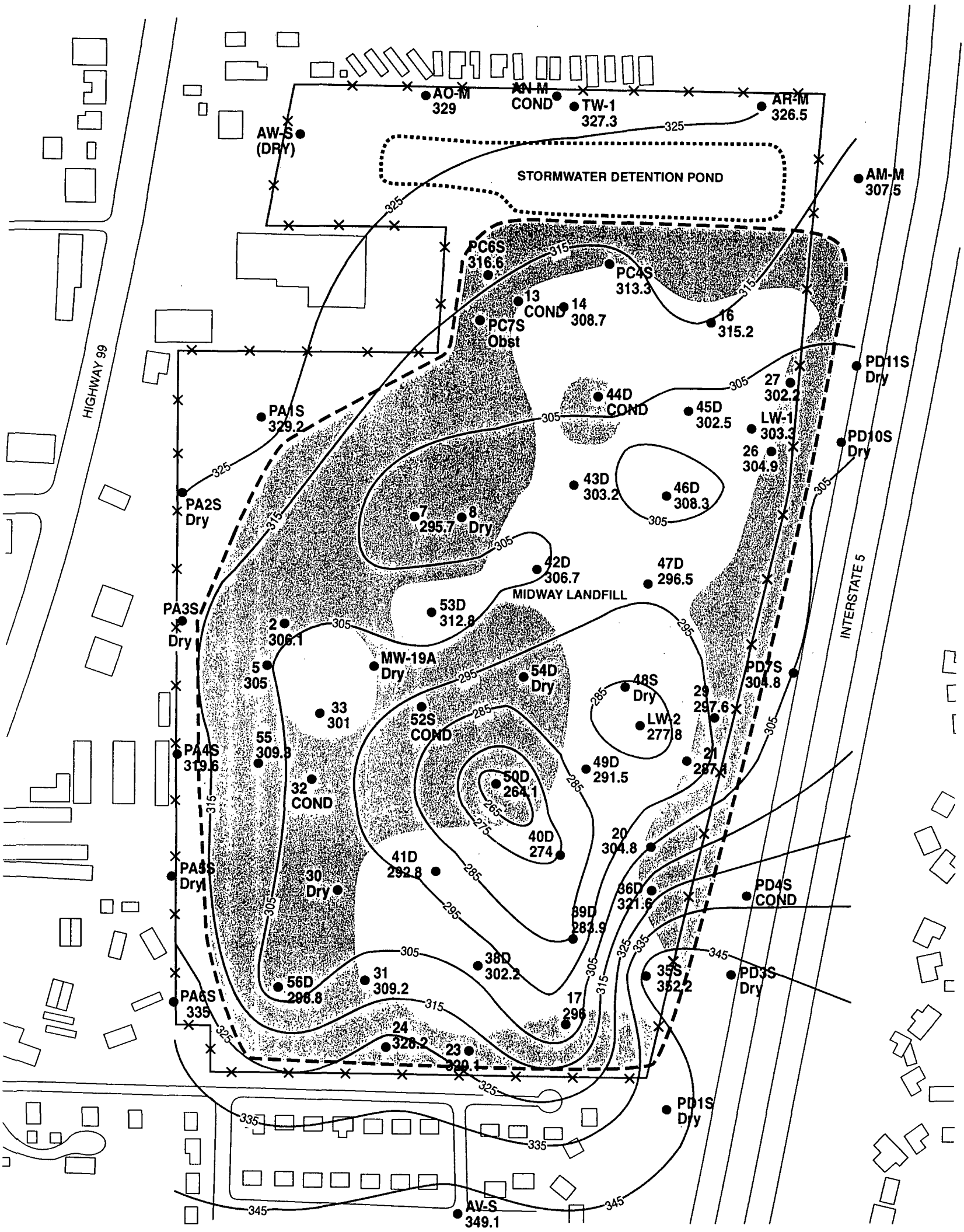
- Municipal landfill refuse
- Poorly sorted mixture of silt, sand, and gravel
- Sand and gravel
- Sand
- Silt, clay, and silty fine sand
- Organic sediments
- C — Condensate present in the well

HORIZONTAL SCALE IN FEET

0 200 400

NOTES: This cross section is a diagrammatic interpretation of sub-surface conditions based on interpolation and extrapolation between borings. Geologic and hydrologic conditions are substantially more complex than depicted.

Figure 3-4.
Generalized East-West Cross Section of Monitoring Units
Midway Landfill
Kent, Washington



Midway/Groundwater Remediation Status Report/55-1550-35(1AR) 4/99

Basemap Source: City of Seattle, Department of Engineering, Midway Landfill Vicinity Map 5/15/86.
Potentiometric Map Source: Parametrix (1998a).

Potentiometric surface generated using Surfer, Version 4, Golden Software

Fenced Area Boundary

320.00 — Fluid Level Contour. Interval equals 10 feet. Contour placement is approximate.

40D 275.8 — Well number and approximate location, showing leachate or groundwater elevation. Fluid elevations measured November 1998.

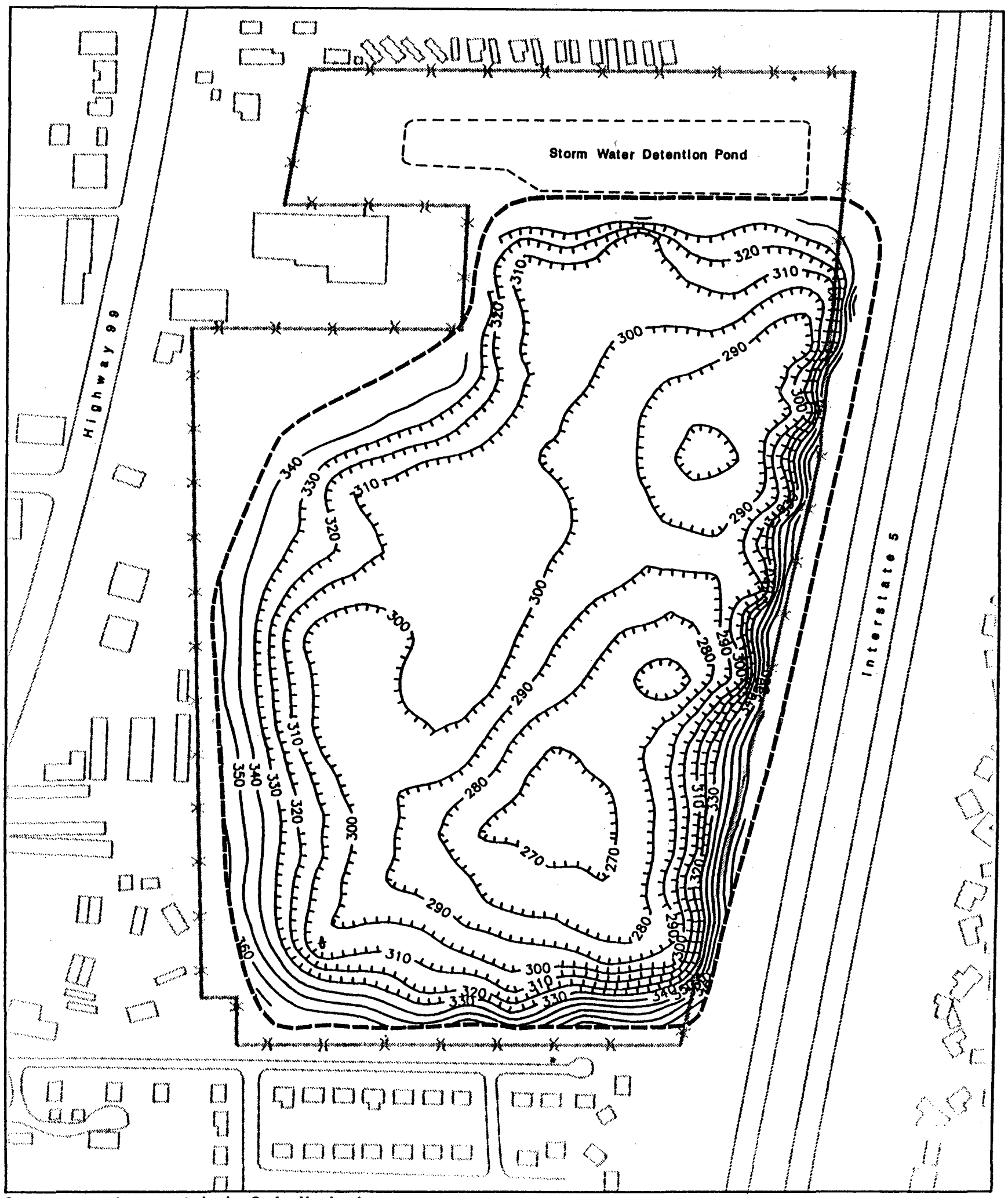
48S COND — Condensate is present in well. Data point not used for potentiometric surface calculations.

Approximate Area Where Potentiometric Surface is Below Refuse Based on Intersection of November 1998 Potentiometric Surface with Base of Refuse

SCALE IN FEET
0 125 250

N

Figure 3-5.
Shallow Groundwater/ Saturated Refuse Potentiometric Surface Map - November 1998
Midway Landfill
Kent, Washington



Contours computer generated using Surfer, Version 4

Fenced Site Boundary

Approximate limits of refuse

340 Base of refuse elevation (feet)

SCALE IN FEET

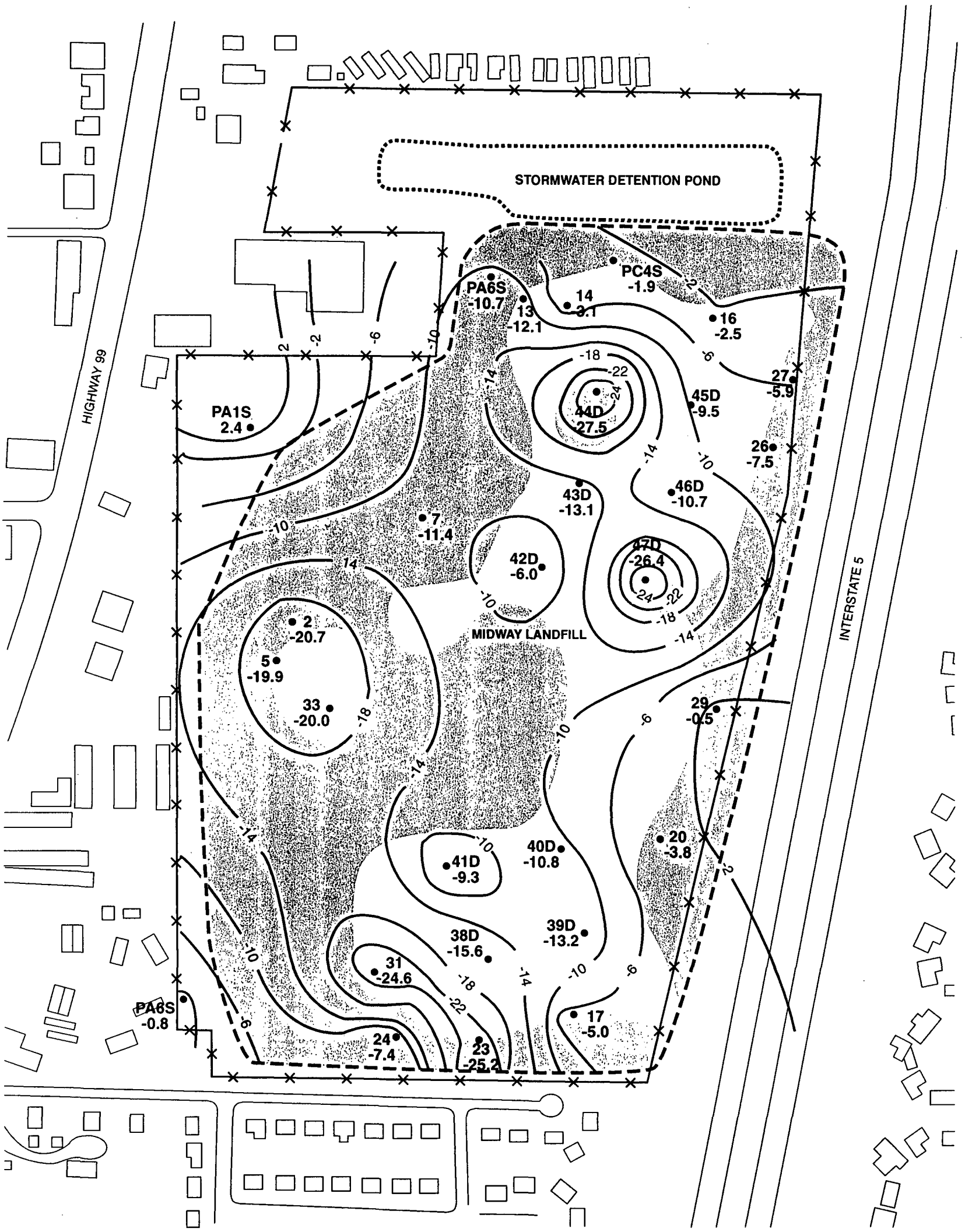
0 125 250

N

Note: This figure shows the general configuration of the base of refuse as estimated from well log data. Actual base of refuse elevations likely differ in some areas.

Source: Leachate Characterization Report, Midway Landfill RI/FS AGI, 1990

Figure 3-6.
Base of Refuse Elevation Map
Midway Landfill
Kent, Washington



Notes: Dry wells or wells w/condensate were not used in generating this figure.

Contours were generated using Surfer4.0

Only the wells listed in Table 3-1 were used to construct lines of equal change

Approximate Area Where Potentiometric Surface is Below Refuse Based on Intersection of November 1998 Potentiometric Surface with Base of Refuse

-10 Lines of Equal Change

Fenced Site Boundary

41 Gas Probe, Gas Extraction Well, or Groundwater Monitoring Well Number and Location

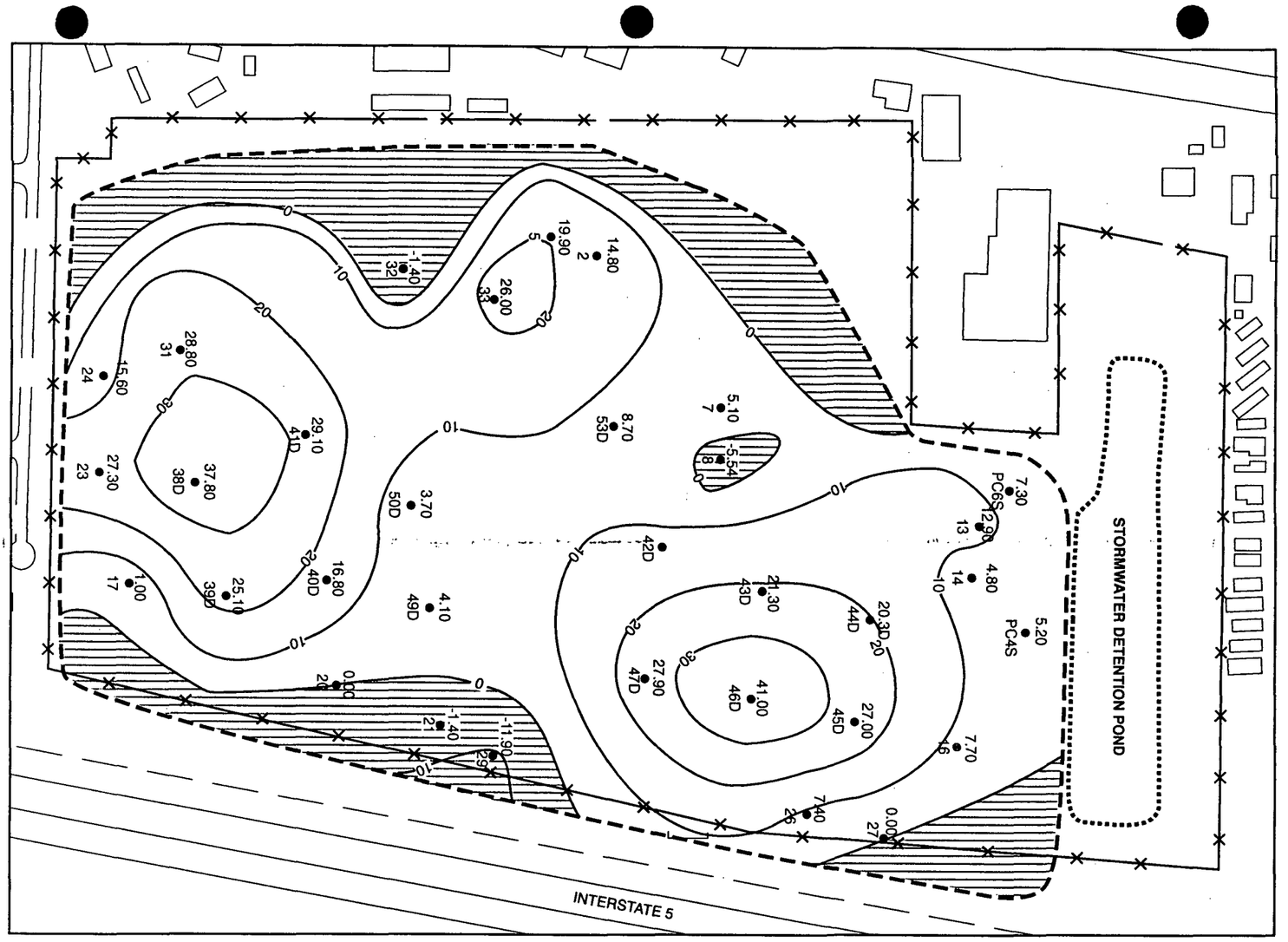
-20 Elevation change at well location

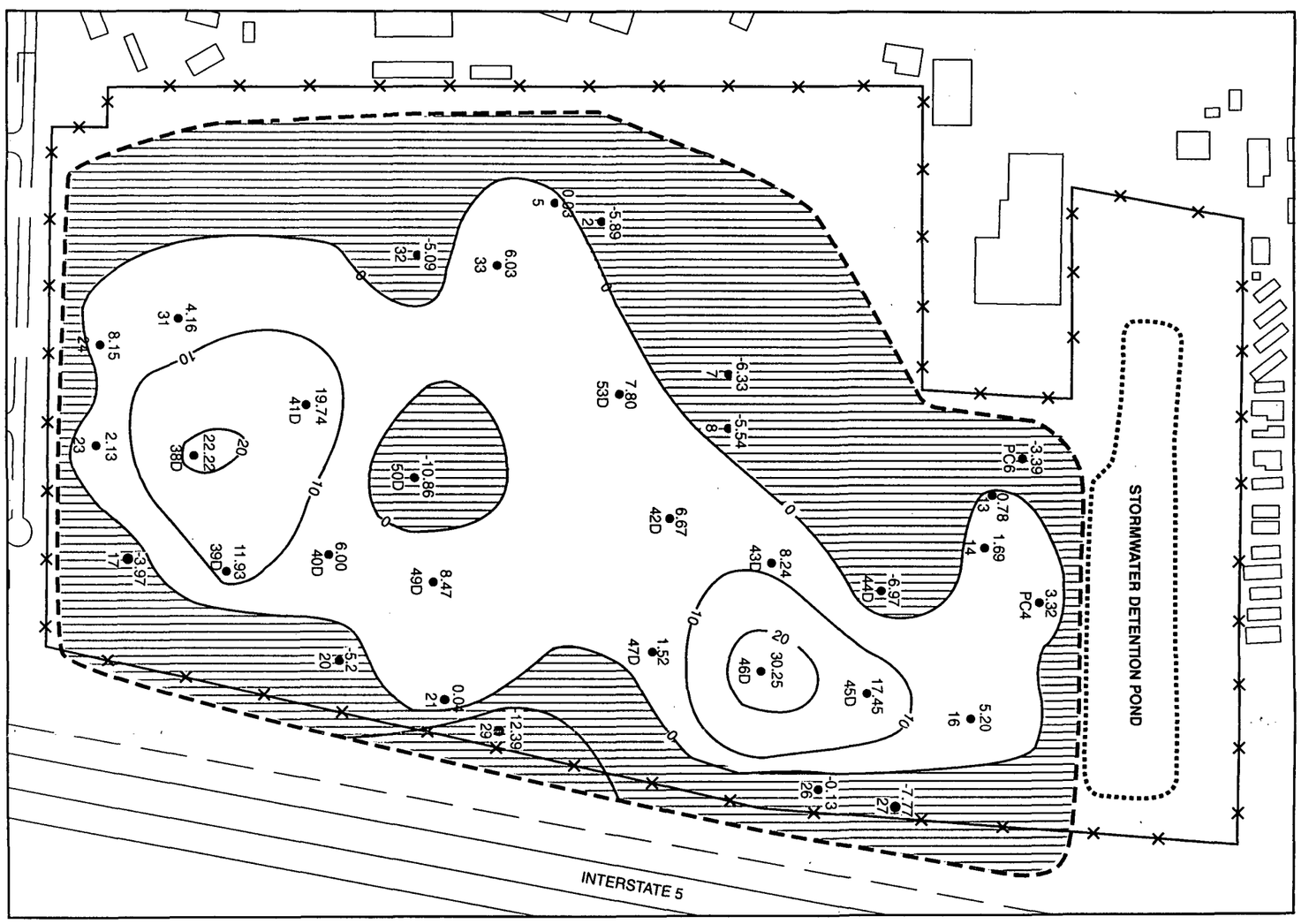
Approximate Limit of Refuse

SCALE IN FEET
0 125 250

N

Figure 3-7.
Map of Fluid Elevation Changes, November 1988 to November 1998 for Shallow Groundwater/ Saturated Refuse, Midway Landfill Kent, Washington





Midway/55-1550-37(01AR) 6/99

Base Map Source: City of Seattle Department of Engineering
Midway Landfill Vicinity Map, 5-15-86

- Area where sturated thickness of refuse is less than zero
- 10.86 location where groundwater elevation is below refuse
- Boundary of refuse
- Fenced Site Boundary
- 20 — Gas Probe, Gas Extraction Well, or Groundwater Monitoring Well Number and Location
- *8.47* — Approximate Saturated Thickness of Refuse In Monitoring Point

SCALE IN FEET
0 125 250

N

Figure 3-8.
Saturated Thickness of Refuse Maps November 1988 and November 1998
Midway Landfill
Kent, Washington

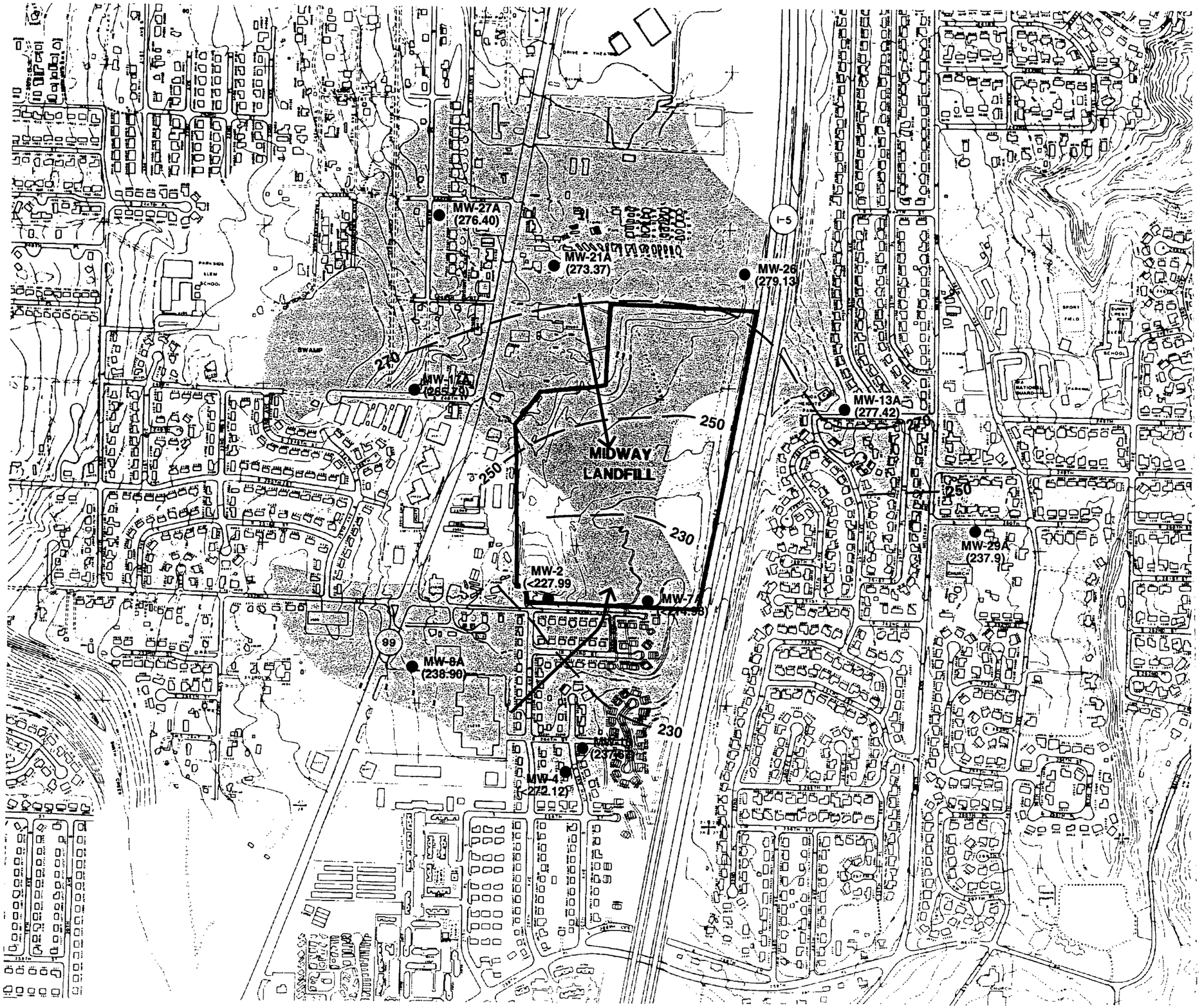


Figure 3-9.
Generalized Upper Gravel Aquifer Potentiometric Surface Map — November 1998
Midway Landfill
Kent, Washington

MW-7A ●	Upper Gravel Aquifer Monitoring Well Number and Approximate Location
—260—	Approximate Potentiometric Surface Contour (in feet)
(195.03)	Measured Groundwater Elevation in Feet (November 9, 1998)
←	General Direction of Groundwater Flow
NM	Water Level Not Measured
(<188.7)	Well was Dry, Elevation is Elevation of Bottom of Well
▒	Inferred Extent of Upper Gravel Aquifer

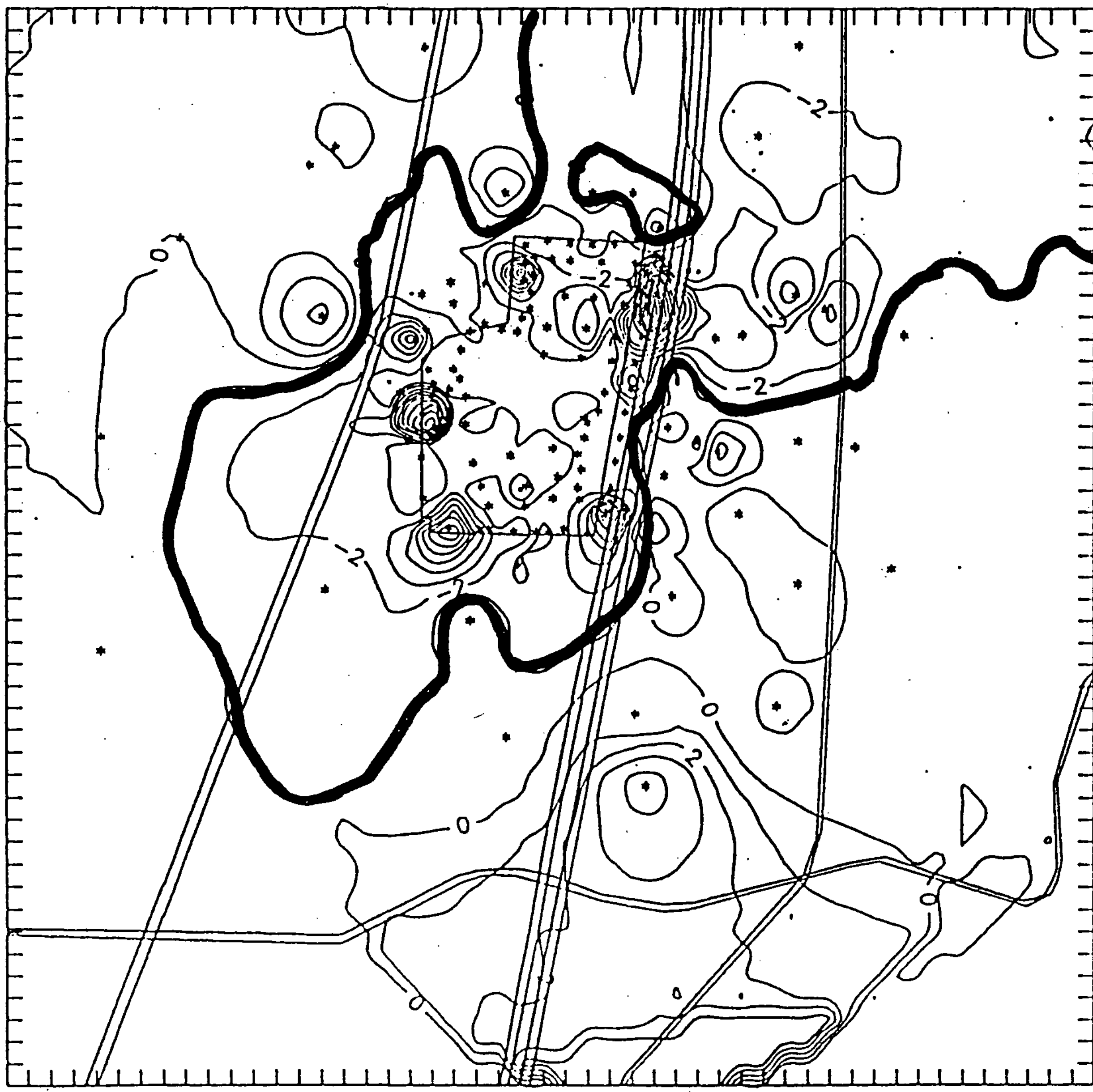
Base Map Source: Supplemental Hydrogeologic and Hydrochemical Investigation, AGI, 1990

SCALE IN FEET
0 300 600
N

Midway/55-1550-34(03) 6/99

Preliminary Figure 3-10
Landfill Gas System Gas Contours

PRESSURE GRADIENTS 1QT, 1997



SCALE 1:1000

The heavy contour line depicts the lateral extent of the vacuum in the Upper Gravel Aquifer beneath the landfill, which results from operation of the gas extraction system.

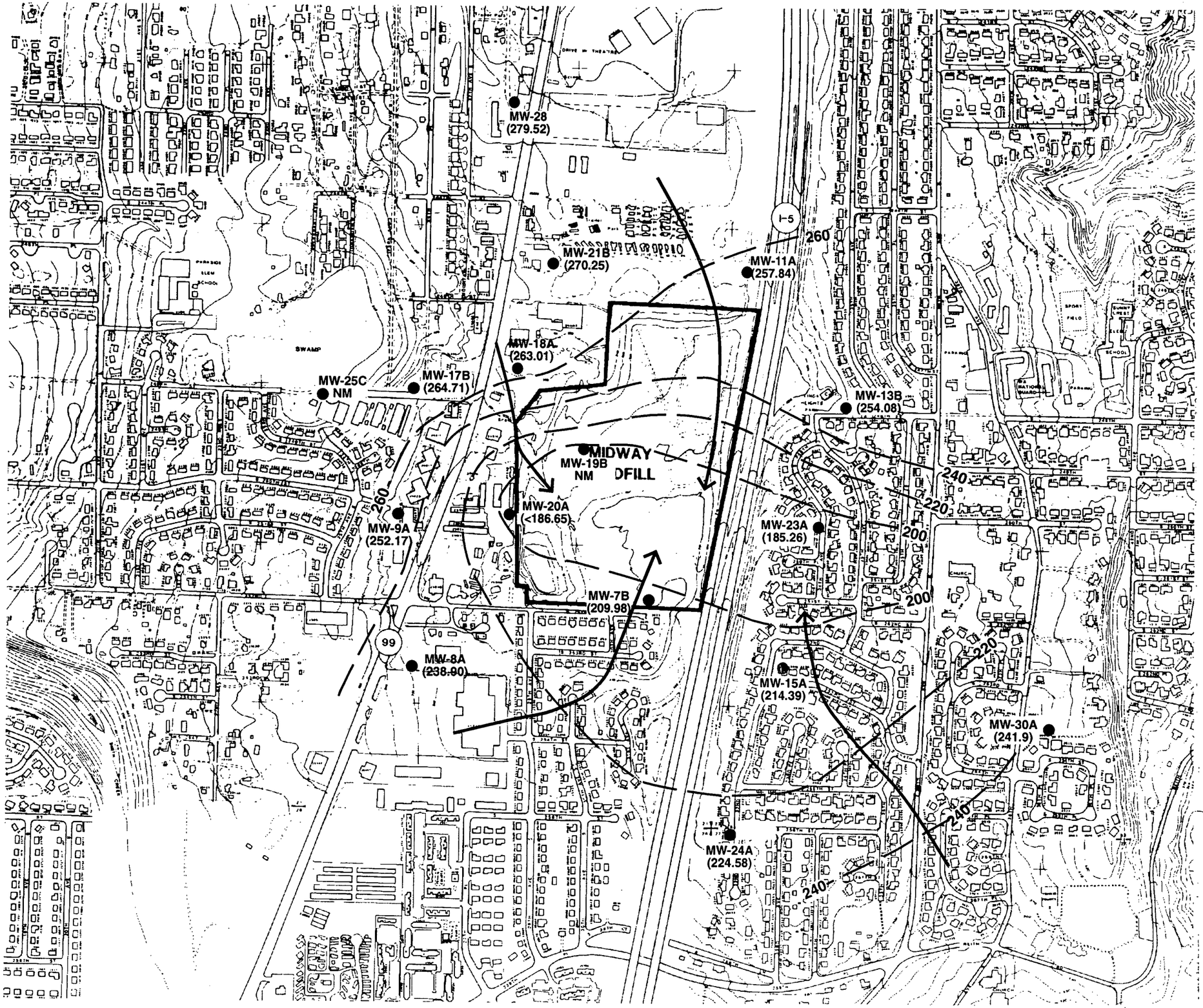


Figure 3-11.
Generalized Sand Aquifer Potentiometeric Surface Map
November 1998
Midway Landfill
Kent, Washington

MW-11A ●	Sand Aquifer Monitoring Well Number and Approximate Location
—220—	Approximate Potentiometric Surface Contour (in feet)
(195.03)	Measured Groundwater Elevation in Feet (November 9, 1998)
←	General Direction of Groundwater Flow
NM	Water Level Not Measured
(<188.7)	Well was Dry, Elevation is Elevation of Bottom of Well

Base Map Source: Supplemental Hydrogeologic and Hydrochemical Investigation, AGI 1990

SCALE IN FEET
0 300 600

N

Midway/55-1550-34(03) 6/99

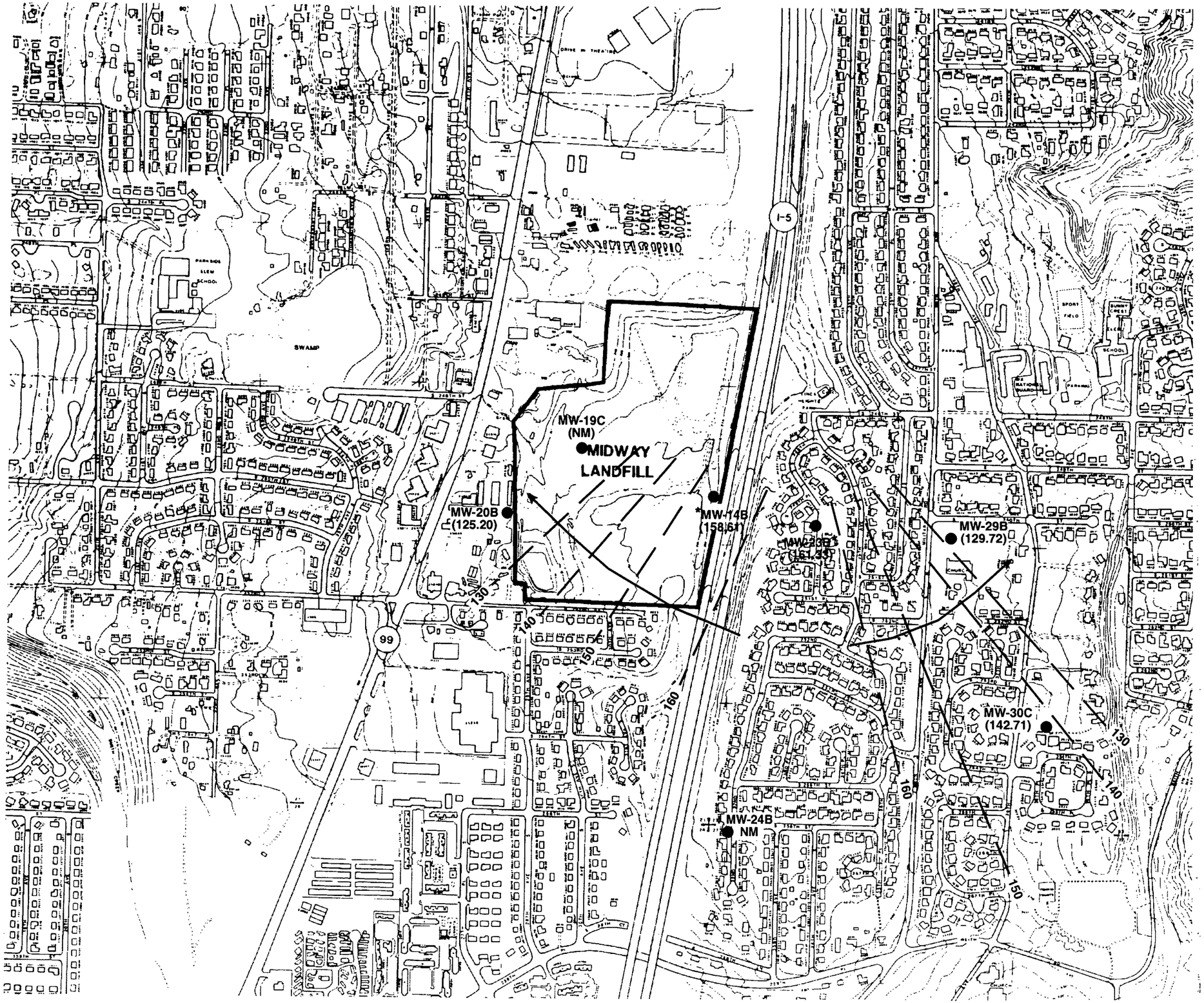


Figure 3-12.
Generalized Southern Gravel Aquifer Potentiometric Surface Map—November 1998
Midway Landfill
Kent, Washington

MW-14B ●	Southern Gravel Aquifer Monitoring Well Number and Approximate Location
—150—	Approximate Potentiometric Surface Contour (in feet)
(161.33)	Measured Groundwater Elevation in Feet (November 9, 1998)
⟸	General Direction of Groundwater Flow
NM	Water Level Not Measured
(<188.7)	Well was Dry, Elevation is Elevation of Bottom of Well
*	Groundwater Level in These Wells Calculated Using Air Pressure Measurements at the Wellheads

Base Map Source: Supplemental Hydrogeologic and Hydrochemical Investigation, AGI 1990

SCALE IN FEET
0 300 600

N

Midway/Annual Report/55-1550-35(01AR) 6/99

Appendix A
Upgradient and Regional Sources of Contamination

COPY

Parametrix, Inc.

Consultants in Engineering and Environmental Sciences

5808 Lake Washington Blvd. N.E. Suite 200 Kirkland, WA 98033-7350
425-822-8880 • Fax: 425-889-8808

Mr. Jeff Neuner
Landfill Closure Operations
City of Seattle
8100 2nd Avenue South
Seattle, Washington 98108

December 17, 1998
55-1550-35

Re: Evaluation of Upgradient Source of Non-Landfill Related Contamination

Dear Jeff:

To evaluate the upgradient source of contamination, a regulatory database review was conducted. The purpose of this review was to identify sites that have documented releases upgradient of the landfill in the general vicinity of MW-17B and MW-21B. The database review was conducted by Vista Information Solutions, Inc. (Vista). Vista searched the following regulatory databases:

Agency	Database	Radius from Landfill
USEPA	NPL sites	1 mile
USEPA	RCRA TSD facilities	1 mile
Washington State Department of Ecology (WA Ecology)	State priority list (SPL)	1 mile
WA Ecology	State CERCLIS list (SCL)	1 mile
USEPA	CERCLIS list	½ mile
WA Ecology	LUST list	½ mile
WA Ecology	Permitted solid waste facilities	½ mile
WA Ecology	Site register (Toxics)	½ mile
WA Ecology	UST list	¼ mile
USEPA	ERNS	⅛ mile
USEPA	RCRA large and small quantity generators	⅛ mile

The results of this database search are presented as an attachment. Vista listed 39 sites within a 1-mile radius of the site. Fifteen of these sites are located upgradient of the landfill near wells MW-17B and MW-21B.

If you have any questions, please contact me at (425) 828-4202, extension 2305.

Sincerely,

Kurt A. Easthouse, P.G.
Project Manager

SITE ASSESSMENT REPORT
(EXTENDED BY 1/2 MILE)

PROPERTY INFORMATION	CLIENT INFORMATION
Project Name/Ref #: Not Provided MIDWAY LANDFILL 24808 PACIFIC HWY S KENT, WA 98032 Cross Street: 252ND ST Latitude/Longitude: (47.378414, 122.293927)	KURT EASTHOUSE PARAMETRIX INC-KIRKLAND 5808 LAKE WASHINGTON BLVD NE KIRKLAND, WA 98033

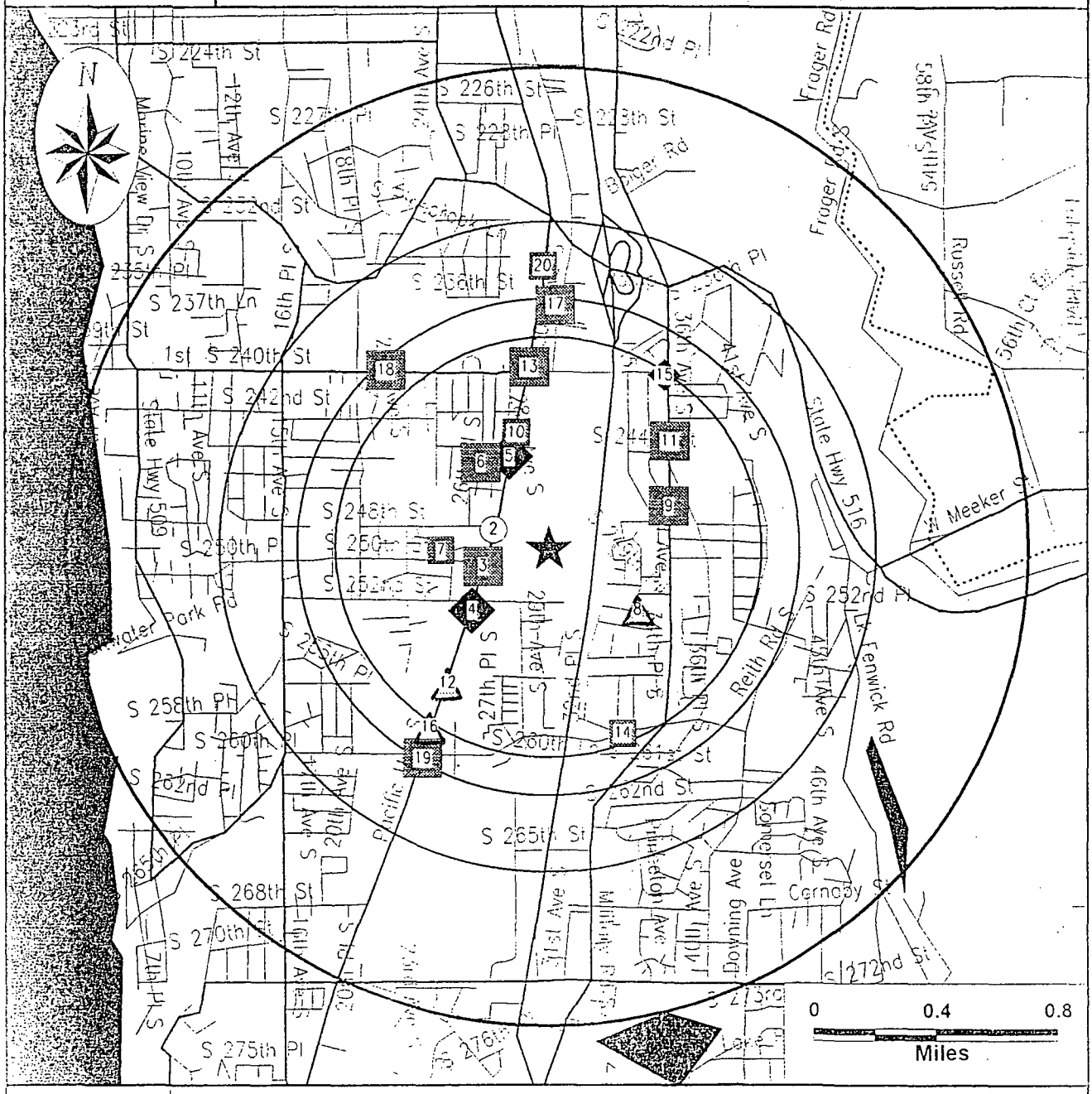
Site Distribution Summary Agency / Database - Type of Records			within 5/8 mile	5/8 to 3/4 mile	3/4 to 1 mile	1 to 1 1/2 mile
A) Databases searched to 1 1/2 mile:						
US EPA	NPL	National Priority List	2	0	0	0
US EPA	CORRACTS (TSD)	RCRA Corrective Actions and associated TSD	0	0	0	0
STATE	SPL	State equivalent priority list	2	0	0	0
B) Databases searched to 1 mile:						
STATE	SCL	State equivalent CERCLIS list	4	0	0	-
US EPA	CERCLIS / NFRAP	Sites currently or formerly under review by US EPA	4	0	0	-
US EPA	TSD	RCRA permitted treatment, storage, disposal facilities	0	0	0	-
STATE	LUST	Leaking Underground Storage Tanks	9	4	2	-
STATE	SWLF	Permitted as solid waste landfills, incinerators, or transfer stations	0	0	0	-
STATE	TOXICS	Washington Site Register	12	4	1	-
C) Databases searched to 3/4 mile:						
STATE	UST	Registered underground storage tanks	12	7	-	-
D) Databases searched to 5/8 mile:						
US EPA	ERNS	Emergency Response Notification System of spills	1	-	-	-
US EPA	LG GEN	RCRA registered large generators of hazardous waste	4	-	-	-
US EPA	SM GEN	RCRA registered small generators of hazardous waste	6	-	-	-

This report meets the ASTM standard E-1527 for standard federal and state government database research in a Phase I environmental site assessment. A (-) indicates a distance not searched because it exceeds these ASTM search parameters.

NOTES

SITE ASSESSMENT REPORT
(EXTENDED BY 1/2 MILE)

Map of Sites within 1 1/2 Miles



Category:	A	B	C	D
Databases Searched to:	1 1/2 mi.	1 mi.	3/4 mi.	5/8 mi.
Single Sites	◆	■	△	○
Multiple Sites	◆	■	△	○
	NPL, SPL, CORRACTS (TSD)	CERCLIS\ NFRAP, TSD, LUST, SWLF, SCL	UST	ERNS, GENERATORS

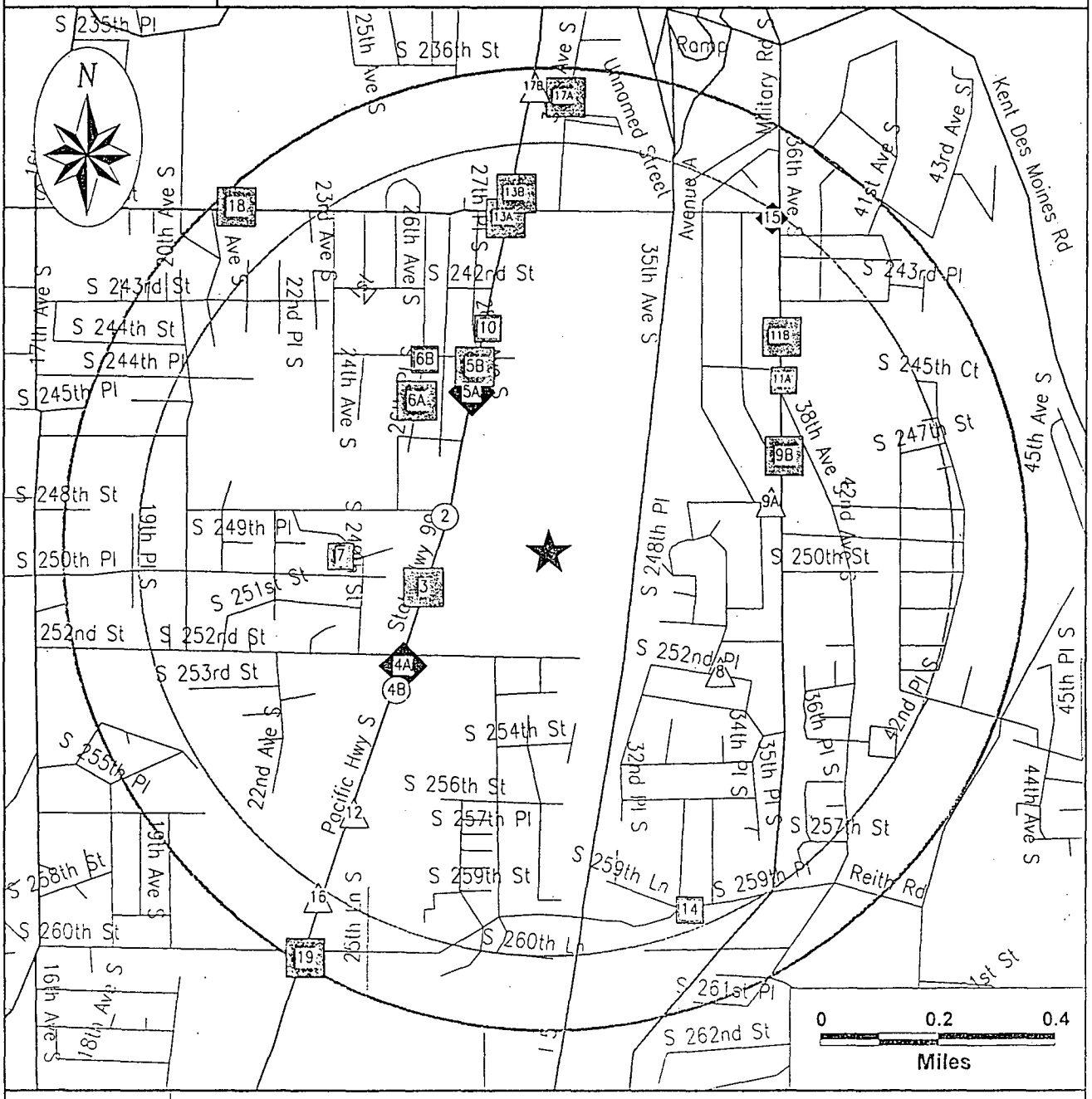
Subject Site ★

Highways and Major Roads
Roads
Railroads
Rivers or Water Bodies
Utilities

If additional databases are listed in the cover page of the report, they are also displayed on this map. The map symbol used corresponds to the database category letter A,B,C,D.

SITE ASSESSMENT REPORT
(EXTENDED BY 1/2 MILE)

Map of Sites within 3/4 Miles



Category:	A	B	C	D
Databases Searched to:	1 1/2 mi.	1 mi.	3/4 mi.	5/8 mi.
Single Sites	◈	▣	△	○
Multiple Sites	◈	▣	△	○
	NPL, SPL, CORRACTS (TSD)	CERCLIS, NFRAP, TSD, LUST, SWLF, SCL	UST	ERNS, GENERATORS

Subject Site ★

Highways and Major Roads
Roads
Railroads
Rivers or Water Bodies
Utilities

If additional databases are listed in the cover page of the report they are also displayed on this map. The map symbol used corresponds to the database category letter A,B,C,D.

SITE ASSESSMENT REPORT
(EXTENDED BY 1/2 MILE)

Sites Represented as Polygons

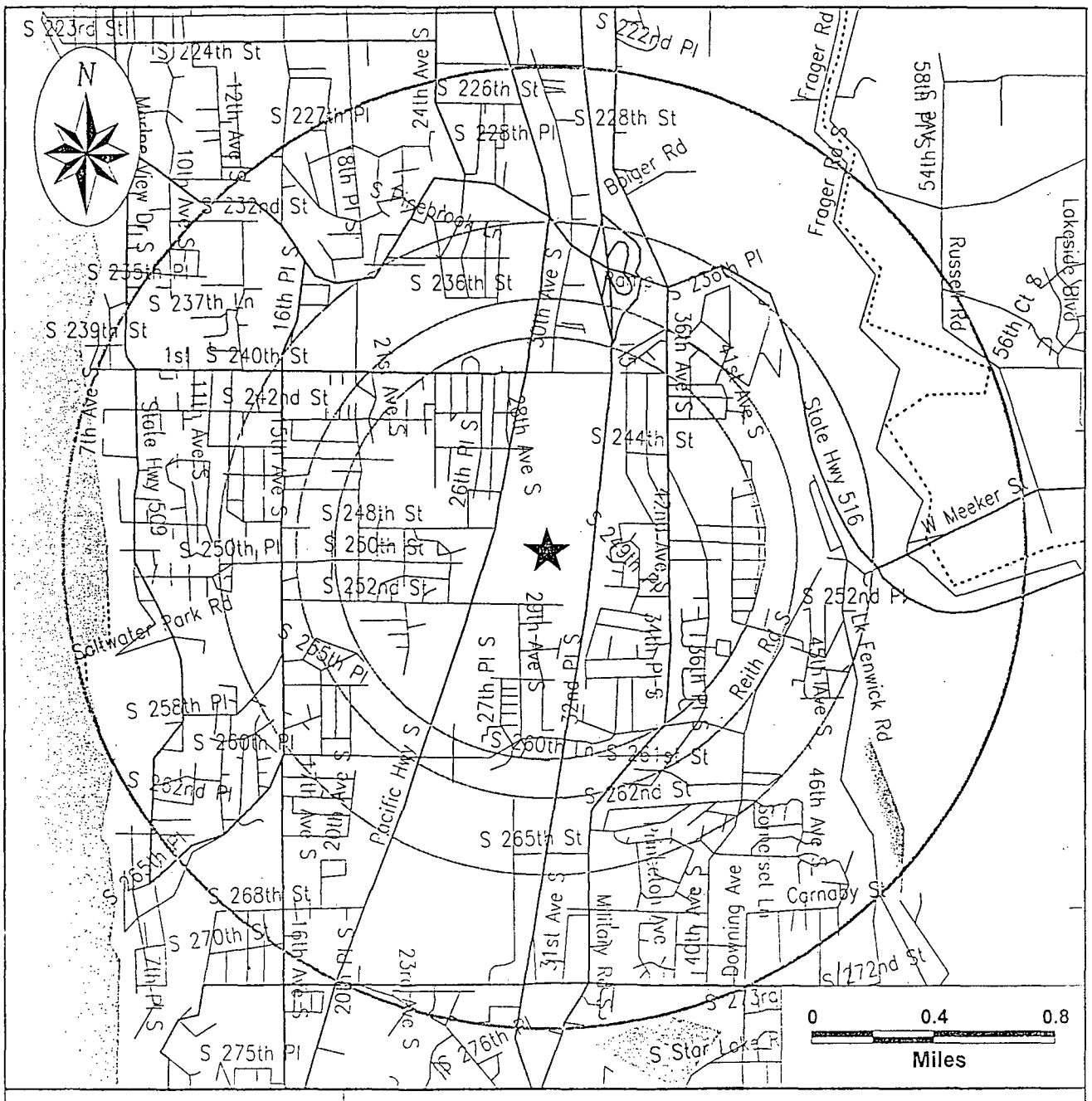
These boundaries are approximated from agency records or other sources such as published maps. They may represent property boundaries, impact zones, or study areas. For more information contact the agency referenced by source number in the site listing.

Subject Site

Highways and Major Roads
Roads
Railroads
Rivers or Water Bodies
Utilities

SITE ASSESSMENT REPORT
(EXTENDED BY 1/2 MILE)

Street Map



Subject Site

Highways and Major Roads
Roads
Railroads
Rivers or Water Bodies
Utilities

SITE ASSESSMENT REPORT
(EXTENDED BY 1/2 MILE)

SITE INVENTORY

MAP ID	PROPERTY AND THE ADJACENT AREA (within 5/8 mile)	VISTA ID DISTANCE DIRECTION	A			B						C	D		
			NPL	CORRACTS(TSD)	SPL	SCL	CERCLIS/NFRAP	TSD	LUST	SWLF	TOXICS	UST	ERNS	LG GEN	SM GEN
1	MIDWAY LANDFILL 24800 PACIFIC HWY S KENT, WA 98031	1856138 0.00 MI	X			X	X							X	
2	SEA TAC TRANSMISSION 24805 PACIFIC HWY S KENT, WA 98032	373067 0.12 MI W												X	
3	MIDWAY TRANSMISSION 25009 PACIFIC HWY SOUTH KENT, WA 98032	6287919 0.16 MI W							X		X				
3	C-DORY INC 25028 PACIFIC HWY S KENT, WA 98032	74418 0.16 MI W													X
3	RS COLOR DESIGN INC 25015 PACIFIC HWY S KENT, WA 98032	362524 0.16 MI W													X
4A	S 252ND ST PACIFIC HWY S S 252ND ST PACIFIC HWY S KENT, WA 98032	6959887 0.23 MI SW			X										
4A	GULL STATION 25250 PACIFIC HWY S. KENT, WA 98032	6808744 0.26 MI SW									X				
4A	FRED MEYER KENT 25250 PACIFIC HWY S KENT, WA 98032	1847849 0.26 MI SW							X		X	X			
4B	MIDWAY CLASSIC CLEANERS INC 25440 PACIFIC HWY S KENT, WA 98032	273605 0.29 MI SW													X
5A	NORTHWEST POWDER COATS 24453 PACIFIC HWY S KENT, WA 98032	2884250 0.24 MI NW			X										
5A	FORMER PRODUCTION PLASTICS PLANT SIT 24602 PACIFIC HIGHWAY SO KENT, WA 98032	1847848 0.24 MI NW										X			
5B	SKIPS AUTO REBUILD 24433 PACIFIC HWY S KENT, WA 98032	393360 0.26 MI NW												X	
5B	MIDWAY RENTAL OIL INC 24432 PACIFIC HWY SO KENT, WA 98032	1847847 0.27 MI NW							X		X	X			

X = search criteria; • = tag-along (beyond search criteria).
For more information call VISTA Information Solutions, Inc. at 1 - 800 - 767 - 0403.

MAP ID	PROPERTY AND THE ADJACENT AREA (within 5/8 mile)	VISTA ID DISTANCE DIRECTION	A			B							C	D		
			NPL	CORRACTS(TSD)	SPL	SCL	CERCLIS/NFRAP	TSD	LUST	SWLF	TOXICS		UST	ERNS	LG GEN	SM GEN
5B	B B AIRCRAFT EQUIPMENT 24401 PACIFIC HWY S KENT, WA 98032	6500009 0.28 MI NW									X				X	
5B	B B AIRCRAFT FORMER GULL 24401 PAC HWY S SEATTLE, WA 98198	7312343 0.29 MI NW							X				X			
6A	VICTORIAN PHASE II (TWO REPORTS) 24512/24517 26TH PLACE S. SEATTLE, WA 98198	7370594 0.27 MI NW									X					
6A	DAVIS CONSTRUCTION CO INC 24515 26TH PL S SEATTLE, WA 98198	1853234 0.28 MI NW				X										
6B	HAUSER PROPERTY DAVIS CONST S 244TH 26TH PL S SEATTLE, WA 98198	6959772 0.32 MI NW				X										
7	HIGHLINE COMMUNITY COLLEGE 2400 S. 249TH ST. SEATTLE, WA 98198	2883034 0.29 MI W									X					
8	FIRE STATION 73 (OLD) 3514 SOUTH 252ND KENT, WA 98032	3835210 0.30 MI SE											X			
9A	LINDA HEIGHTS PUMP STATION 3406 SOUTH 248TH STREET KENT, WA 98032	1840918 0.32 MI E											X			
9B	EXXON #7 7751 24718 36TH AVE. S. KENT, WA 98032	7247915 0.37 MI E									X					
9B	BP EXPLORATION OIL INC 03164 24718 36TH AVE S KENT, WA 98032	1841255 0.37 MI E							X				X			X
10	WIDING TRANSPORTATION INC KENT 24300 PACIFIC HWY S KENT, WA 98032	469326 0.33 MI N					X						X			
11A	CENTRAL MINI MART 24526 MILITARY RD S KENT, WA	3629291 0.43 MI NE							X							
11B	MINI MART 24429 36TH AVE. S. KENT, WA 98032	6808273 0.46 MI NE									X					
11B	USARMY NGB OMS 5 24410 MILITARY RD KENT, WA 980324110	5077051 0.48 MI NE					X									
11B	ORGANIZATIONAL MAINTENANCE SHOP5 24410 MILITARY RD KENT, WA 980324110	4355170 0.48 MI NE							X				X			
11B	MILITARY DEPARTMENT - KENT ARMORY 199 24410 MILITARY ROAD KENT, WA 98032	4257261 0.48 MI NE									X					

MAP ID	PROPERTY AND THE ADJACENT AREA (within 5/8 mile)	VISTA ID / DISTANCE / DIRECTION	A			B						C	D		
			NPL	CORRACTS(TSD)	SPL	SCL	CERCLIS/NFRAP	TSD	LUST	SWLF	TOXICS	UST	ERNS	LG GEN	SM GEN
12	RANGER FIBERGLASS BOATS 25802 PACIFIC HWY SOUTH KENT, WA 98032	1847850 0.49 MI SW										X			
13A	ARCO 4484 24001 PACIFIC COAST HWY KENT, WA 98032	1847895 0.50 MI N							X			X			
13A	ARCO #4484 24001 PACIFIC HWY S KENT, WA 98032	3756512 0.51 MI N													X
13B	MIDWAY MUFFLER RADIATOR 23898 PACIFIC HWY S KENT, WA 98032	3272296 0.53 MI N													X
13B	UNOCAL #6211 23845 PACIFIC HWY S. KENT, WA 98031	4267354 0.55 MI N									X				
13B	6211 23845 PACIFIC HWY SO KENT, WA 98032	1847846 0.55 MI N							X			X			
13B	UNOCAL 23845 PACIFIC HIGHWAY SOUTH KENT, WA 98032	200147897 0.55 MI N											X		
14	FLOYD R. HUNT, INC. 3219 S. 259TH PL. KENT, WA 98032	1853224 0.59 MI SE									X				
15	KENT HIGHLANDS LANDFILL 240TH MILITARY RD KENT, WA 98032	373160 0.61 MI NE	X			X	X								

MAP ID	SITES IN THE SURROUNDING AREA (within 5/8 - 3/4 mile)	VISTA ID / DISTANCE / DIRECTION	A			B						C	D		
			NPL	CORRACTS(TSD)	SPL	SCL	CERCLIS/NFRAP	TSD	LUST	SWLF	TOXICS	UST	ERNS	LG GEN	SM GEN
16	MIDWAY CHEVRON 25915 PACIFIC HWY SO SEATTLE, WA 98198	7821757 0.64 MI SW										X			
17A	MURRAY'S COLLISION CENTER 23608 30TH AVENUE SOUTH KENT, WA 98032	7312283 0.70 MI N							X			X			
17A	MURRAY'S COLLISION CENTER 23608 30TH AVE. S. SEATTLE, WA 98198	7497975 0.70 MI N									X				
17B	MINIT-LUBE #1114 23610 PACIFIC HWY SOUTH KENT, WA 98032	1847845 0.72 MI N										X			

MAP ID	SITES IN THE SURROUNDING AREA (within 5/8 - 3/4 mile)	VISTA ID / DISTANCE / DIRECTION	A			B							C	D		
			NPL	CORRACTS(TSD)	SPL	SCL	CERCLIS/NFRAP	TSD	LUST	SWLF	TOXICS	UST	ERNS	LG GEN	SM GEN
18	CC HIGHLINE COMMUNITY COLLEGE 2400 S 240TH ST. SEATTLE, WA 98198	6783911 0.72 MI NW							X						
18	CC HIGHLINE COMMUNITY COLLEGE 2400 S 240TH ST. SEATTLE, WA 98198	4865299 0.72 MI NW										X			
19	SEA-TAC ROOFING SUPPLY INC. 2427 SOUTH 260 TH STREET KENT, WA 98032	1840957 0.72 MI SW										X			
19	SHELL 260TH PACIFIC HWY S. DES MOINES, WA 98198	1856070 0.73 MI SW									X				
19	7-ELEVEN FOOD STORE #2303-18758J 26007 PACIFIC HWY S KENT, WA 98032	5749989 0.74 MI SW							X		X	X			
19	SHELL #246 4060 1209 26010 PACIFIC HWY S. KENT, WA 98032	4105349 0.75 MI SW									X				
19	OH'S MART 26010 PACIFIC HWY S KENT, WA 98032	7248151 0.75 MI SW							X			X			

MAP ID	SITES IN THE SURROUNDING AREA (within 3/4 - 1 mile)	VISTA ID / DISTANCE / DIRECTION	A			B							C	D		
			NPL	CORRACTS(TSD)	SPL	SCL	CERCLIS/NFRAP	TSD	LUST	SWLF	TOXICS	UST	ERNS	LG GEN	SM GEN
17	MIDWAY AUTO REPAIR 23452 30TH AVE DES MOINES, WA	6607217 0.76 MI N							X						
17	MIDWAY AUTO REPAIR 23452 30TH AVE. S. SEATTLE, WA 98198	7247899 0.76 MI N									X				
20	DP FUELS INC. #63-232-0503 23419 PACIFIC HWY S KENT, WA 98032	6387918 0.85 MI N							X						

MAP ID	SITES IN THE SURROUNDING AREA (within 1 - 1 1/2 mile)	VISTA ID / DISTANCE / DIRECTION	A			B							C	D		
			NPL	CORRACTS(TSD)	SPL	SCL	CERCLIS/NFRAP	TSD	LUST	SWLF	TOXICS	UST	ERNS	LG GEN	SM GEN
No Records Found																

X = search criteria; • = tag-along (beyond search criteria).
For more information call VISTA Information Solutions, Inc. at 1 - 800 - 767 - 0403.

UNMAPPED SITES	VISTA ID	A			B							C	D		
		NPL	CORRACTS(TSD)	SPL	SCL	CERCLIS/NFRAP	TSD	LUST	SWLF	TOXICS	UST	ERNS	LG GEN	SM GEN
SHELL/TEXACO 23419 PACIFIC HWY S. TUKWILA, WA 98188	4267353									X				

X = search criteria; • = tag-along (beyond search criteria).
For more information call VISTA Information Solutions, Inc. at 1 - 800 - 767 - 0403.

SITE ASSESSMENT REPORT
(EXTENDED BY 1/2 MILE)

DETAILS

PROPERTY AND THE ADJACENT AREA (within 5/8 mile)

				Map ID
VISTA Address*:	MIDWAY LANDFILL 24800 PACIFIC HWY S KENT, WA 98031	VISTA ID#: Distance Plotted as:	1856138 0.00 MI Polygon	1

RCRA-LgGen - RCRA-Large Generator / SRC# 4467		EPA ID:	WAD980638910
Agency Address:	*MIDWAY LANDFILL 24800 PACIFIC HWY S KENT, WA 98032*		
Generator Class:	*Generates at least 1000 kg./month of non-acutely hazardous waste (or 1 kg./month of acutely hazardous waste).*		
SCL - State Equivalent CERCLIS List / SRC# 4901		Agency ID:	2043 WARM 0
Agency Address:	*MIDWAY LANDFILL 24808 PACIFIC HWY S KENT, WA 98032*		
Status:	*UNKNOWN*		
Facility Type:	*NOT AVAILABLE*		
Lead Agency:	*NOT AVAILABLE*		
State Status:	*NOT AVAILABLE*		
Pollutant 1:	*CONVENTIONAL CONTAMINANTS, ORGANIC*		
Pollutant 2:	*UNKNOWN*		
Pollutant 3:	*UNKNOWN*		
CERCLIS / SRC# 4941		EPA ID:	WAD980638910
Agency Address:	*MIDWAY LANDFILL 24800 PACIFIC HWY S. KENT, WA 98031*		
Site Description:	*ORGANIC CHEMICALS AND HEAVY METALS HAVE BEEN DETECTED IN THEWATER SUPPLY AQUIFER. THE CITY OF SEATTLE IS PREPARING TO CLOSE T*		
Site Description:	*HE LANDFILL AND TO SET UP MONITORING WELLS AROUND THESITE.*		

PROPERTY AND THE ADJACENT AREA (within 5/8 mile) CONT.

EPA Region:	10
Congressional District:	9
Federal Facility:	NOT A FEDERAL FACILITY
Facility Ownership:	MUNICIPALITY
Site Incident Category:	unknown
Federal Facility Docket:	Agency Code ( )
NPL Status:	CURRENTLY ON FINAL NPL
Incident Type:	Unknown
Proposed NPL Update #:	2
Final NPL Update #:	0
Financial Management System ID:	1053
Latitude:	4722450
Longitude:	12217350
Lat/Long Source:	RESEARCHED BY THE REGION AND MANUALLY ENTERED
Lat/Long Accuracy:	Unknown
Dioxin Tier:	Unknown
USGS Hydro Unit:	17110013
RCRA Indicator:	Unknown

Alias Name:	BORDEN INC - MIDWAY DSPL SITE		
Alias Street:	24600 PACIFIC HWY S		
Alias City:	KENT	Alias Latitude:	4728360
Alias Zip:	98055	Alias Longitude:	12212000
Alias State:	WA		
Alias Description:	NOT REPORTED		
Alias Name:	MIDWAY LANDFILL		
Alias Street:	NOT REPORTED		
Alias City:	KING	Alias Latitude:	4722450
Alias Zip:	NOT REPORTED	Alias Longitude:	12217350
Alias State:	WA		
Alias Description:	NOT REPORTED		
Alias Name:	SEATTLE, CY OF, MIDWAY LDFL		
Alias Street:	NOT REPORTED		
Alias City:	NOT REPORTED	Alias Latitude:	0
Alias Zip:	NOT REPORTED	Alias Longitude:	0
Alias State:	WA		
Alias Description:	NOT REPORTED		
Unit Id:	0		
Unit Name:	SITEWIDE		
Unit Id:	1		
Unit Name:	NOT REPORTED		

Financial Type:	Date:	Financial Amount ($):
TES/ESS TASKING	DECEMBER 15, 1987	18912
TES/ESS TASKING	JANUARY 21, 1988	896
TES/ESS DETASKING	JANUARY 31, 1988	2308
TES/ESS TASKING	MARCH 15, 1988	3301
TES/ESS TASKING	MARCH 31, 1988	2574
TES/ESS DETASKING	MAY 15, 1988	12482
TES/ESS DETASKING	SEPTEMBER 30, 1988	1634
ACTUAL OBLIGATION	MARCH 23, 1985	374247
ACTUAL OBLIGATION	DECEMBER 13, 1985	20000

PROPERTY AND THE ADJACENT AREA (within 5/8 mile) CONT.

Type:	DISCOVERY	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	Unknown	Actual Completion Date:	JUNE 1, 1981
Type:	Agency Code (GP)	Lead Agency:	FEDERAL ENFORCEMENT
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	Unknown	Actual Completion Date:	DECEMBER 11, 1990
Type:	HAZARD RANKING SYSTEM SCORE	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	Unknown	Actual Completion Date:	APRIL 17, 1984
Type:	FINAL LISTING ON NPL	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	Unknown	Actual Completion Date:	JUNE 10, 1986
Type:	PROPOSED FOR NPL	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	Unknown	Actual Completion Date:	OCTOBER 15, 1984
Type:	PRELIMINARY ASSESSMENT	Lead Agency:	STATE, FUND FINANCED
Qualifier:	HIGHER PRIORITY	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	AUGUST 30, 1984
Plan Status:	Unknown	Actual Completion Date:	SEPTEMBER 1, 1984
Type:	REMOVAL INVESTIGATION AT NPL SITES	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	PRIMARY	Actual Completion Date:	SEPTEMBER 10, 1990
Type:	REMOVAL INVESTIGATION AT NPL SITES	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	APRIL 30, 1992
Plan Status:	Unknown	Actual Completion Date:	APRIL 30, 1992
Type:	REMOVAL ACTION	Lead Agency:	PRP LEAD UNDER STATE
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	MAY 31, 1990
Plan Status:	PRIMARY	Actual Completion Date:	NOVEMBER 1, 1991
Type:	SCREENING SITE INSPECTION	Lead Agency:	STATE, FUND FINANCED
Qualifier:	HIGHER PRIORITY	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	JANUARY 1, 1983
Plan Status:	Unknown	Actual Completion Date:	JANUARY 1, 1983
Type:	SCREENING SITE INSPECTION	Lead Agency:	EPA FUND-FINANCED
Qualifier:	HIGHER PRIORITY	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	JANUARY 1, 1983
Plan Status:	Unknown	Actual Completion Date:	JANUARY 1, 1983
Type:	COMBINED RI/FS	Lead Agency:	STATE, FUND FINANCED
Qualifier:	HIGHER PRIORITY	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	MARCH 23, 1985
Plan Status:	ALTERNATE	Actual Completion Date:	OCTOBER 3, 1986

PROPERTY AND THE ADJACENT AREA (within 5/8 mile) CONT.

Type:	COMBINED RI/FS	Lead Agency:	PRP LEAD UNDER STATE
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	OCTOBER 3, 1986
Plan Status:	PRIMARY	Actual Completion Date:	NOT REPORTED
Type:	COMMUNITY RELATIONS PLAN	Lead Agency:	STATE, FUND FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	Unknown	Actual Completion Date:	JULY 1, 1985
Type:	FORWARD PLANNING PROCESS	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	DECEMBER 20, 1984
Plan Status:	Unknown	Actual Completion Date:	MARCH 31, 1985
Type:	REMOVAL ACTION	Lead Agency:	PRP LEAD UNDER STATE
Qualifier:	PARTIAL CLEANUP	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	JANUARY 31, 1991
Plan Status:	PRIMARY	Actual Completion Date:	DECEMBER 31, 1991

Name:	Lead Agency:	Actual Start Date:	Actual Completion Date:
NOT REPORTED	FEDERAL ENFORCEMENT	NOT REPORTED	UNKNOWN
NOT REPORTED	STATE ENFORCEMENT	NOT REPORTED	UNKNOWN
NOT REPORTED	STATE ENFORCEMENT	UNKNOWN	UNKNOWN
NOT REPORTED	FEDERAL ENFORCEMENT	NOT REPORTED	UNKNOWN
NOT REPORTED	STATE ENFORCEMENT	UNKNOWN	UNKNOWN
NOT REPORTED	STATE ENFORCEMENT	NOT REPORTED	UNKNOWN
NOT REPORTED	FEDERAL ENFORCEMENT	UNKNOWN	UNKNOWN
NOT REPORTED	FEDERAL ENFORCEMENT	NOT REPORTED	UNKNOWN
NOT REPORTED	STATE ENFORCEMENT	NOT REPORTED	UNKNOWN
NOT REPORTED	STATE ENFORCEMENT	UNKNOWN	UNKNOWN
NOT REPORTED	FEDERAL ENFORCEMENT	NOT REPORTED	UNKNOWN
NOT REPORTED	STATE ENFORCEMENT	UNKNOWN	UNKNOWN
NOT REPORTED	STATE ENFORCEMENT	NOT REPORTED	UNKNOWN
NOT REPORTED	FEDERAL ENFORCEMENT	UNKNOWN	UNKNOWN

NPL - National Priority List / SRC# 5074	EPA ID:	WAD980638910

Agency Address:	MIDWAY LANDFILL 24900 PACIFIC HWY S. KENT, WA 98031
EPA Region:	0
Congressional District:	0
Federal Facility:	Agency Code ( )
Facility Ownership:	NOT AVAILABLE
Site Incident Category:	unknown
Federal Facility Docket:	Agency Code ( )
NPL Status:	UNKNOWN
Incident Type:	Unknown
Proposed NPL Update #:	0
Final NPL Update #:	0
Financial Management System ID:	NOT REPORTED
Latitude:	0
Longitude:	0
Lat/Long Source:	Agency Code ( )
Lat/Long Accuracy:	Unknown
Dioxin Tier:	Unknown
USGS Hydro Unit:	0
RCRA Indicator:	Unknown
Alias Name:	BORDEN INC - MIDWAY DSPL SITE
Alias Street:	24900 PACIFIC HWY S

Alias City:	KENT	Alias Latitude:	4728360
Alias Zip:	98055	Alias Longitude:	12212000
Alias State:	NOT REPORTED		
Alias Name:	SEATTLE, CY OF, MIDWAY LDFL		
Alias Street:	NOT REPORTED		
Alias City:	NOT REPORTED	Alias Latitude:	0
Alias Zip:	NOT REPORTED	Alias Longitude:	0
Alias State:	NOT REPORTED		
Alias Name:	MIDWAY LANDFILL		
Alias Street:	NOT REPORTED		
Alias City:	KING	Alias Latitude:	4722450
Alias Zip:	NOT REPORTED	Alias Longitude:	12217350
Alias State:	NOT REPORTED		

				Map ID
VISTA Address*:	SEA TAC TRANSMISSION 24805 PACIFIC HWY S KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	373067 0.12 MI / W Point	2
RCRA-LgGen - RCRA-Large Generator / SRC# 4467		EPA ID:	WAD042479790	
Agency Address:	SAME AS ABOVE			
Generator Class:	Generates at least 1000 kg./month of non-acutely hazardous waste (or 1 kg./month of acutely hazardous waste).			

				Map ID
VISTA Address*:	MIDWAY TRANSMISSION 25009 PACIFIC HWY SOUTH KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	6887919 0.16 MI / W Point	3
STATE LUST - State Leaking Underground Storage Tank / SRC# 4979		EPA/Agency ID:	N/A	
Agency Address:	SAME AS ABOVE			
Facility ID:	409381			
Leak ID#:	409384			
Date Discovered:	3/24/97			
Media Affected:	SOIL			
Description / Comment:	F NAME: MIDWAY TRANSMISSION FACILITY COUNTY: KING			
Description / Comment:	ECOLOGY REGION: NW			
Description / Comment:	RELEASE STATUS INFO: AWAITING CLEANUP 3/24/97			
WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A	
Agency Address:	MIDWAY TRANSMISSION 25009 PACIFIC HWY S. KENT, WA 98032			
Region:	NORTHWEST			
State Detail Description:	NO			
Contact:	NOT REPORTED			
Description:	WASTE:PETROLEUM PRODUCT			
Description:	DATE ECOLOGY RECEIVED REPORT:3/24/97			
Description:	MEDIA:SOIL			
Description:	REPORT TYPE:INTERIM			
Description:	ISSUE OF SITE REGISTER:94-50			

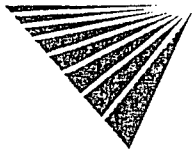
VISTA Address*:	C-DORY INC 25028 PACIFIC HWY S KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	74418 0.16 MI / W Point	Map ID 3
RCRA-SmGen - RCRA-Small Generator / SRC# 4467		EPA ID:	WAD130126964	
Agency Address:	*SAME AS ABOVE*			
Generator Class:	*Generates 100 kg./month but less than 1000 kg./month of non-acutely hazardous waste*			

VISTA Address*:	RS COLOR DESIGN INC 25015 PACIFIC HWY S KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	362524 0.16 MI / W Point	Map ID 3
RCRA-SmGen - RCRA-Small Generator / SRC# 4467		EPA ID:	WAD982653750	
Agency Address:	*SAME AS ABOVE*			
Generator Class:	*Generates 100 kg./month but less than 1000 kg./month of non-acutely hazardous waste*			

VISTA Address*:	S 252ND ST PACIFIC HWY S S 252ND ST PACIFIC HWY S KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	6959887 0.23 MI / SW Point	Map ID 4A
SPL - State Equivalent Priority List / SRC# 4902		Agency ID:	2333 WARM 4	
Agency Address:	*SAME AS ABOVE*			
Status:	*UNKNOWN*			
Facility Type:	*NOT AVAILABLE*			
Lead Agency:	*NOT AVAILABLE*			
State Status:	*NOT AVAILABLE*			
Pollutant 1:	*PETROLEUM*			
Pollutant 2:	*SOLVENTS*			
Pollutant 3:	*UNKNOWN*			

VISTA Address*:	GULL STATION 25250 PACIFIC HWY S. KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	6808744 0.26 MI / SW Point	Map ID 4A
WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A	
Agency Address:	*SAME AS ABOVE*			
Region:	*NORTHWEST*			
State Detail Description:	*NO*			
Contact:	*NOT REPORTED*			
Description:	*WASTE:PETROLEUM PRODUCT*			
Description:	*DATE ECOLOGY RECEIVED REPORT:10/17/90*			
Description:	*MEDIA:SOIL*			
Description:	*REPORT TYPE:FINAL*			
Description:	*ISSUE OF SITE REGISTER:90-14*			

VISTA Address*:	FRED MEYER KENT 25250 PACIFIC HWY S KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	1847849 0.26 MI / SW Point	Map ID 4A
STATE LUST - State Leaking Underground Storage Tank / SRC# 4979		EPA/Agency ID:	N/A	
Agency Address:	*FRED MEYER INC* *25250 PACIFIC HWY S* *KENT, WA 980326528*			
Facility ID:	*632*			
Leak ID#:	*1217*			
Date Discovered:	*2/17/89*			



* VISTA address includes enhanced city and ZIP.
For more information call VISTA Information Solutions, Inc. at 1 - 800 - 767 - 0403.

Media Affected:	SOIL
Description / Comment:	F NAME: FRED MEYER KENT (1992) FACILITY COUNTY: KING
Description / Comment:	ECOLOGY REGION: NW
Description / Comment:	RELEASE STATUS INFO: CLEANUP STARTED 2/17/89

STATE LUST - State Leaking Underground Storage Tank / SRC# 4979	EPA/Agency ID:	N/A

Agency Address:	FRED MEYER INC 25250 PACIFIC HWY S KENT, WA 980326528
Facility ID:	632
Leak ID#:	3822
Date Discovered:	8/12/92
Media Affected:	SOIL
Description / Comment:	F NAME: FRED MEYER KENT (1992) FACILITY COUNTY: KING
Description / Comment:	ECOLOGY REGION: NW
Description / Comment:	RELEASE STATUS INFO: CLEANUP STARTED 8/12/92

STATE UST - State Underground Storage Tank / SRC# 4980	Agency ID:	632

Agency Address:	FRED MEYER INC 25250 PACIFIC HWY S KENT, WA 98032
Underground Tanks:	1
Aboveground Tanks:	NOT REPORTED
Tanks Removed:	1

Tank ID:	1U	Tank Status:	REMOVED
Tank Contents:	USED OIL, WASTE OIL	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	1100 (GALLONS)	Tank Material:	NOT AVAILABLE

WA Toxics - Washington Toxics / SRC# 5108	EPA/Agency ID:	N/A

Agency Address:	FRED MEYER 25250 PACIFIC HWY S. KENT, WA 98032
Region:	NORTHWEST
State Detail Description:	NO
Contact:	NOT REPORTED
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:12/16/93
Description:	MEDIA:SOIL
Description:	REPORT TYPE:FINAL
Description:	ISSUE OF SITE REGISTER:93-34

VISTA Address*:	MIDWAY CLASSIC CLEANERS INC 25440 PACIFIC HWY S KENT, WA 98032	VISTA ID#:	273605
		Distance/Direction:	0.29 MI / SW
		Plotted as:	Point

Map ID
4B

RCRA-SmGen - RCRA-Small Generator / SRC# 4467	EPA ID:	WAD980987572

Agency Address:	SAME AS ABOVE
Generator Class:	Generates 100 kg./month but less than 1000 kg./month of non-acutely hazardous waste

VISTA Address*:	NORTHWEST POWDER COATS 24453 PACIFIC HWY S KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	2884250 0.24 MI / NW Point	Map ID 5A

SPL - State Equivalent Priority List / SRC# 4902		Agency ID:	2332 WARM 3
Agency Address:	*SAME AS ABOVE*		
Status:	*UNKNOWN*		
Facility Type:	*NOT AVAILABLE*		
Lead Agency:	*NOT AVAILABLE*		
State Status:	*NOT AVAILABLE*		
Pollutant 1:	*HALOGENATED ORGANIC COMPOUNDS*		
Pollutant 2:	*UNKNOWN*		
Pollutant 3:	*UNKNOWN*		

VISTA Address*:	FORMER PRODUCTION PLASTICS PLANT SIT 24602 PACIFIC HIGHWAY SO KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	1847848 0.24 MI / NW Point	Map ID 5A

STATE UST - State Underground Storage Tank / SRC# 4980		Agency ID:	5507
Agency Address:	*FORMER PRODUCTION PLASTICS PLANT SIT 24602 PACIFIC HIGHWAY SO KENT, WA 98431*		
Underground Tanks:	*1*		
Aboveground Tanks:	*NOT REPORTED*		
Tanks Removed:	*1*		

Tank ID:	*1U*	Tank Status:	*REMOVED*
Tank Contents:	*UNLEADED GAS*	Leak Monitoring:	*NOT AVAILABLE*
Tank Age:	*34*	Tank Piping:	*NOT AVAILABLE*
Tank Size (Units):	*NOT REPORTED (NOT AVAILABLE)*	Tank Material:	*STEEL*

VISTA Address*:	SKIPS AUTO REBUILD 24433 PACIFIC HWY S KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	383360 0.26 MI / NW Point	Map ID 5B

RCRA-LgGen - RCRA-Large Generator / SRC# 4467		EPA ID:	WAD085813590
Agency Address:	*SAME AS ABOVE*		
Generator Class:	*Generates at least 1000 kg./month of non-acutely hazardous waste (or 1 kg./month of acutely hazardous waste).*		

VISTA Address*:	MIDWAY RENTAL OIL INC 24432 PACIFIC HWY SO KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	1847847 0.27 MI / NW Point	Map ID 5B

STATE LUST - State Leaking Underground Storage Tank / SRC# 4979		EPA/Agency ID:	N/A
Agency Address:	*MIDWAY RENTAL OIL INC 24432 PACIFIC HWY SO KENT, WA 980324080*		
Facility ID:	*2337*		
Leak ID#:	*2279*		
Date Discovered:	*5/30/91*		
Media Affected:	*SOIL*		
Description / Comment:	*F NAME: MIDWAY RENTAL AND OIL CO FACILITY COUNTY: KING*		
Description / Comment:	*ECOLOGY REGION: NW*		
Description / Comment:	*RELEASE STATUS INFO: CLEANUP STARTED 6/1/95*		

STATE UST - State Underground Storage Tank / SRC# 4980			Agency ID:	2337
Agency Address:	SAME AS ABOVE			
Underground Tanks:	2			
Aboveground Tanks:	NOT REPORTED			
Tanks Removed:	NOT REPORTED			
Tank ID:	1U	Tank Status:	CLOSURE PENDING	
Tank Contents:	HEATING OIL	Leak Monitoring:	NOT AVAILABLE	
Tank Age:	34	Tank Piping:	NOT AVAILABLE	
Tank Size (Units):	10000 (GALLONS)	Tank Material:	NOT AVAILABLE	
Tank ID:	2U	Tank Status:	CLOSURE PENDING	
Tank Contents:	HEATING OIL	Leak Monitoring:	NOT AVAILABLE	
Tank Age:	34	Tank Piping:	NOT AVAILABLE	
Tank Size (Units):	10000 (GALLONS)	Tank Material:	NOT AVAILABLE	

WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A
Agency Address:	MIDWAY RENTAL AND OIL COMPANY 24432 PACIFIC HWY S. KENT, WA 98032		
Region:	NORTHWEST		
State Detail Description:	NO		
Contact:	NOT REPORTED		
Description:	WASTE:PETROLEUM PRODUCT		
Description:	DATE ECOLOGY RECEIVED REPORT:2/19/93		
Description:	MEDIA:SOIL		
Description:	REPORT TYPE:INTERIM		
Description:	ISSUE OF SITE REGISTER:92-46		

VISTA Address*:	B B AIRCRAFT EQUIPMENT 24401 PACIFIC HWY S KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	6500009 0.28 MI / NW Point

Map ID
5B

RCRA-LgGen - RCRA-Large Generator / SRC# 4467		EPA ID:	WAD988475778
Agency Address:	B B AIRCRAFT EQUIPMENT 24401 PACIFIC HWY S DES MOINES, WA 98198		
Generator Class:	Generates at least 1000 kg./month of non-acutely hazardous waste (or,1 kg./month of acutely hazardous waste).		

WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A
Agency Address:	B B AIRCRAFT (THREE REPORTS) 24401 PACIFIC HWY S. DES MOINES, WA 98198		
Region:	NORTHWEST		
State Detail Description:	NO		
Contact:	NOT REPORTED		
Description:	WASTE:PETROLEUM PRODUCT		
Description:	DATE ECOLOGY RECEIVED REPORT:7/2/97		
Description:	MEDIA:SOIL		
Description:	REPORT TYPE:INTERIM		
Description:	ISSUE OF SITE REGISTER:95-17		

VISTA Address*:	B B AIRCRAFT FORMER GULL 24401 PAC HWY S SEATTLE, WA 98198	VISTA ID#:	7312343	Map ID 5B
		Distance/Direction:	0.29 MI / NW	
		Plotted as:	Point	

STATE LUST - State Leaking Underground Storage Tank / SRC# 4979		EPA/Agency ID:	N/A
Agency Address:	*B B AIRCRAFT FORMER GULL 24401 PAC HWY S DES MOINES, WA*		
Facility ID:	*434888*		
Leak ID#:	*435296*		
Date Discovered:	*7/2/97*		
Media Affected:	*SOIL*		
Description / Comment:	*F NAME: B B AIRCRAFT FORMER GULL FACILITY COUNTY: KING*		
Description / Comment:	*ECOLOGY REGION: NW*		
Description / Comment:	*RELEASE STATUS INFO: CLEANUP STARTED 7/2/97*		

STATE UST - State Underground Storage Tank / SRC# 4980		Agency ID:	434888
Agency Address:	*B B AIRCRAFT FORMER GULL 24401 PAC HWY S DES MOINES, WA*		
Underground Tanks:	*1*		
Aboveground Tanks:	*NOT REPORTED*		
Tanks Removed:	*1*		

Tank ID:	*#1U*	Tank Status:	*REMOVED*
Tank Contents:	*OTHER*	Leak Monitoring:	*NOT AVAILABLE*
Tank Age:	*NOT REPORTED*	Tank Piping:	*NOT AVAILABLE*
Tank Size (Units):	*NOT REPORTED (NOT AVAILABLE)*	Tank Material:	*NOT AVAILABLE*

VISTA Address*:	VICTORIAN PHASE II (TWO REPORTS) 24512/24517 26TH PLACE S. SEATTLE, WA 98198	VISTA ID#:	7370594	Map ID 6A
		Distance/Direction:	0.27 MI / NW	
		Plotted as:	Point	

WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A
Agency Address:	*VICTORIAN PHASE II (TWO REPORTS) 24512/24517 26TH PLACE S. DES MOINES, WA 98198*		
Region:	*NORTHWEST*		
State Detail Description:	*NO*		
Contact:	*NOT REPORTED*		
Description:	*WASTE:PETROLEUM PRODUCT*		
Description:	*DATE ECOLOGY RECEIVED REPORT:2/3/98*		
Description:	*MEDIA:SOIL*		
Description:	*REPORT TYPE:FINAL*		
Description:	*ISSUE OF SITE REGISTER:98-01*		

VISTA Address*:	DAVIS CONSTRUCTION CO INC 24515 26TH PL S SEATTLE, WA 98198	VISTA ID#:	1853234	Map ID 6A
		Distance/Direction:	0.28 MI / NW	
		Plotted as:	Point	
SCL - State Equivalent CERCLIS List / SRC# 4901		Agency ID:	2237 WARM	

Agency Address:	*SAME AS ABOVE*
Status:	*UNKNOWN*
Facility Type:	*NOT AVAILABLE*
Lead Agency:	*NOT AVAILABLE*
State Status:	*NOT AVAILABLE*
Pollutant 1:	*HALOGENATED ORGANIC COMPOUNDS*
Pollutant 2:	*EPA PRIORITY POLLUTANTS-METALS CYANIDE*
Pollutant 3:	*METALS OTHER*

VISTA Address*:	HAUSER PROPERTY DAVIS CONST S 244TH 26TH PL S SEATTLE, WA 98198	VISTA ID#:	6959772	Map ID 6B
		Distance/Direction:	0.32 MI / NW	
		Plotted as:	Point	
SCL - State Equivalent CERCLIS List / SRC# 4901		Agency ID:	2413 WARM	

Agency Address:	*HAUSER PROPERTY DAVIS CONST* *S 244TH 26TH PL S* *DES MOINES, WA 98198*
Status:	*UNKNOWN*
Facility Type:	*NOT AVAILABLE*
Lead Agency:	*NOT AVAILABLE*
State Status:	*NOT AVAILABLE*
Pollutant 1:	*HALOGENATED ORGANIC COMPOUNDS*
Pollutant 2:	*EPA PRIORITY POLLUTANTS-METALS CYANIDE*
Pollutant 3:	*PETROLEUM*

VISTA Address*:	HIGHLINE COMMUNITY COLLEGE 2400 S. 249TH ST. SEATTLE, WA 98198	VISTA ID#:	2883034	Map ID 7
		Distance/Direction:	0.29 MI / W	
		Plotted as:	Point	
WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A	

Agency Address:	*HIGHLINE COMMUNITY COLLEGE* *2400 S. 249TH ST.* *SEATTLE, WA 98148*
Region:	*NORTHWEST*
State Detail Description:	*NO*
Contact:	*NOT REPORTED*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:1/29/92*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:92-35*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:6/16/92*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:92-35*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:1/28/92*
Description:	*MEDIA:SOIL*

Description:	REPORT TYPE:FINAL
Description:	ISSUE OF SITE REGISTER:92-18
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:1/28/92
Description:	MEDIA:SOIL
Description:	REPORT TYPE:INTERIM
Description:	ISSUE OF SITE REGISTER:92-19
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:5/4/92
Description:	MEDIA:SOIL
Description:	REPORT TYPE:INTERIM
Description:	ISSUE OF SITE REGISTER:92-23

				Map ID
VISTA Address*:	FIRE STATION 73 (OLD) 3514 SOUTH 252ND KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	3885210 0.30 MI / SE Point	8
STATE UST - State Underground Storage Tank / SRC# 4980		Agency ID:	101521	

Agency Address:	SAME AS ABOVE		
Underground Tanks:	1		
Aboveground Tanks:	NOT REPORTED		
Tanks Removed:	NOT REPORTED		
Tank ID:	1U	Tank Status:	CLOSURE PENDING
Tank Contents:	OTHER	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	1100 (GALLONS)	Tank Material:	NOT AVAILABLE

				Map ID
VISTA Address*:	LINDA HEIGHTS PUMP STATION 3406 SOUTH 248TH STREET KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	1840918 0.32 MI / E Point	9A
STATE UST - State Underground Storage Tank / SRC# 4980		Agency ID:	12459	

Agency Address:	SAME AS ABOVE		
Underground Tanks:	1		
Aboveground Tanks:	NOT REPORTED		
Tanks Removed:	1		
Tank ID:	1.U	Tank Status:	REMOVED
Tank Contents:	OTHER	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	1100 (GALLONS)	Tank Material:	STEEL

				Map ID
VISTA Address*:	EXXON #7 7751 24718 36TH AVE. S. KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	7247915 0.37 MI / E Point	9B
WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A	

Agency Address:	SAME AS ABOVE
Region:	NORTHWEST
State Detail Description:	NO
Contact:	NOT REPORTED
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:2/9/93
Description:	MEDIA:SOIL

PROPERTY AND THE ADJACENT AREA (within 5/8 mile) CONT.

Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:98-02*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:5/4/98*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:98-05*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:4/3/92*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:92-21*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:1/13/92*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:92-15*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:4/15/92*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:92-22*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:10/13/93*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:93-23*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:5/8/96*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:94-26*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:8/12/96*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:94-33*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:3/5/97*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:94-53*

VISTA Address*:	**BP EXPLORATION OIL INC 03164** **24718 36TH AVE S** **KENT, WA 98032**	VISTA ID#: Distance/Direction: Plotted as:	1841255 0.37 MI / E Point
RCRA-SmGen - RCRA-Small Generator / SRC# 4467		EPA ID:	WAD988488870
Agency Address:	*SAME AS ABOVE*		
Generator Class:	*Generates 100 kg./month but less than 1000 kg./month of non-acutely hazardous waste*		

Map ID
9B

* VISTA address includes enhanced city and ZIP.
For more information call VISTA Information Solutions, Inc. at 1 - 800 - 767 - 0403.

STATE LUST - State Leaking Underground Storage Tank / SRC# 4979		EPA/Agency ID:	N/A
Agency Address:	EXXON 7-7751/STILL 24718 36TH AVE SO KENT, WA 980324105		
Facility ID:	9539		
Leak ID#:	2852		
Date Discovered:	1/6/92		
Media Affected:	SOIL		
Description / Comment:	F NAME: EXXON STATION # 7-7751 FACILITY COUNTY: KING		
Description / Comment:	ECOLOGY REGION: NW		
Description / Comment:	RELEASE STATUS INFO: CLEANUP STARTED 6/1/95		

STATE UST - State Underground Storage Tank / SRC# 4980		Agency ID:	9540
Agency Address:	EXXON 7-7751/STILL/CALDERON 24718 36TH AVE SO KENT, WA 98032		
Underground Tanks:	4		
Aboveground Tanks:	NOT REPORTED		
Tanks Removed:	4		

Tank ID:	1U	Tank Status:	REMOVED
Tank Contents:	UNLEADED GAS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	STEEL
Tank ID:	2U	Tank Status:	REMOVED
Tank Contents:	UNLEADED GAS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	STEEL
Tank ID:	3U	Tank Status:	REMOVED
Tank Contents:	UNLEADED GAS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	STEEL
Tank ID:	4U	Tank Status:	REMOVED
Tank Contents:	USED OIL, WASTE OIL	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	1100 (GALLONS)	Tank Material:	STEEL

STATE UST - State Underground Storage Tank / SRC# 4980		Agency ID:	9539
Agency Address:	EXXON 7-7751/STILL 24718 36TH AVE SO KENT, WA 98032		
Underground Tanks:	1		
Aboveground Tanks:	NOT REPORTED		
Tanks Removed:	NOT REPORTED		

Tank ID:	1U	Tank Status:	CLOSURE PENDING
Tank Contents:	UNLEADED GAS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	24	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	STEEL

VISTA Address*:	WIDING TRANSPORTATION INC KENT 24300 PACIFIC HWY S KENT, WA 98032	VISTA ID#:	469326
		Distance/Direction:	0.33 MI / N
		Plotted as:	Point

Map ID: 10

NFRAP / SRC# 4942 — EPA ID: WAD067156489

Agency Address:	WIDING TRANSPORTATION INC 24300 PACIFIC HWY S KENT, WA 98031
EPA Region:	10
Congressional District:	7
Federal Facility:	NOT A FEDERAL FACILITY
Facility Ownership:	INDIAN LANDS
Site Incident Category:	unknown
Federal Facility Docket:	Agency Code ( )
NPL Status:	NOT ON NPL
Incident Type:	Unknown
Proposed NPL Update #:	0
Final NPL Update #:	0
Financial Management System ID:	NOT REPORTED
Latitude:	4723050
Longitude:	12217440
Lat/Long Source:	RESEARCHED BY THE REGION AND MANUALLY ENTERED
Lat/Long Accuracy:	Unknown
Dioxin Tier:	Unknown
USGS Hydro Unit:	17110013
RCRA Indicator:	Unknown
Unit Id:	0
Unit Name:	ENTIRE SITE

Type:	DISCOVERY	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	Unknown	Actual Completion Date:	UNKNOWN
Type:	PRELIMINARY ASSESSMENT	Lead Agency:	STATE, FUND FINANCED
Qualifier:	HIGHER PRIORITY	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	MAY 2, 1985
Plan Status:	Unknown	Actual Completion Date:	DECEMBER 1, 1985
Type:	SCREENING SITE INSPECTION	Lead Agency:	EPA FUND-FINANCED
Qualifier:	NO FURTHER REMEDIAL ACTION PLANNED	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	UNKNOWN
Plan Status:	Unknown	Actual Completion Date:	AUGUST 1, 1988

STATE UST - State Underground Storage Tank / SRC# 4980 — Agency ID: 10192

Agency Address:	WIDING TRANSPORTATION, INC 24300 PACIFIC HIGHWAY SOUTH KENT, WA 98032
Underground Tanks:	2
Aboveground Tanks:	NOT REPORTED
Tanks Removed:	NOT REPORTED

Tank ID:	02-1U	Tank Status:	CLOSURE PENDING
Tank Contents:	OTHER	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	STEEL

Tank ID:	02-2U	Tank Status:	CLOSURE PENDING
Tank Contents:	LEADED GAS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	STEEL

VISTA Address*:	CENTRAL MINI MART 24526 MILITARY RD S KENT, WA	VISTA ID#: Distance/Direction: Plotted as:	3629291 0.43 MI / NE Point
STATE LUST - State Leaking Underground Storage Tank / SRC# 4979		EPA/Agency ID:	N/A

Map ID 11A

Agency Address:	SAME AS ABOVE
Facility ID:	200599
Leak ID#:	1796
Date Discovered:	2/23/90
Media Affected:	SOIL
Description / Comment:	F NAME: CENTRAL MINI MART FACILITY COUNTY: KING
Description / Comment:	ECOLOGY REGION: NW
Description / Comment:	RELEASE STATUS INFO: CLEANUP STARTED 2/23/90

VISTA Address*:	MINI MART 24429 36TH AVE. S. KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	6808273 0.46 MI / NE Point
WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A

Map ID 11B

Agency Address:	SAME AS ABOVE
Region:	NORTHWEST
State Detail Description:	NO
Contact:	NOT REPORTED
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:8/8/90
Description:	MEDIA:SOIL
Description:	REPORT TYPE:FINAL
Description:	ISSUE OF SITE REGISTER:90-09
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:8/8/90
Description:	MEDIA:SOIL
Description:	REPORT TYPE:FINAL
Description:	ISSUE OF SITE REGISTER:90-09

PROPERTY AND THE ADJACENT AREA (within 5/8 mile) CONT.

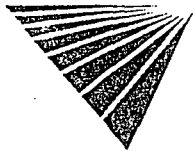
VISTA Address*:	USARMY NGB OMS 5 24410 MILITARY RD KENT, WA 980324110	VISTA ID#:	5077051	Map ID 11B
		Distance/Direction:	0.48 MI / NE	
		Plotted as:	Point	
CERCLIS / SRC# 4941		EPA ID:	WA1211853055	

Agency Address:	USARMY NGB KENT 24410 MILITARY RD KENT, WA 98032
EPA Region:	10
Congressional District:	8
Federal Facility:	FEDERAL FACILITY
Facility Ownership:	UNKNOWN
Site Incident Category:	unknown
Federal Facility Docket:	Agency Code ( )
NPL Status:	NOT ON NPL
Incident Type:	Unknown
Proposed NPL Update #:	0
Final NPL Update #:	0
Financial Management System ID:	NOT REPORTED
Latitude:	4723060
Longitude:	12217060
Lat/Long Source:	RESEARCHED BY THE REGION AND MANUALLY ENTERED
Lat/Long Accuracy:	Unknown
Dioxin Tier:	Unknown
USGS Hydro Unit:	17110013
RCRA Indicator:	Unknown
Unit Id:	0
Unit Name:	SITEWIDE

Type:	DISCOVERY	Lead Agency:	FEDERAL FACILITIES
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	Unknown	Actual Completion Date:	SEPTEMBER 1, 1994
Type:	PRELIMINARY ASSESSMENT	Lead Agency:	FEDERAL FACILITIES
Qualifier:	HIGHER PRIORITY	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	AUGUST 1, 1995
Plan Status:	Unknown	Actual Completion Date:	AUGUST 1, 1995
Type:	SCREENING SITE INSPECTION	Lead Agency:	FEDERAL FACILITIES
Qualifier:	NO FURTHER REMEDIAL ACTION PLANNED	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	JUNE 5, 1997
Plan Status:	Unknown	Actual Completion Date:	JUNE 5, 1997

VISTA Address*:	ORGANIZATIONAL MAINTENANCE SHOP5 24410 MILITARY RD KENT, WA 980324110	VISTA ID#:	4865170	Map ID 11B
		Distance/Direction:	0.48 MI / NE	
		Plotted as:	Point	
STATE LUST - State Leaking Underground Storage Tank / SRC# 4979		EPA/Agency ID:	N/A	

Agency Address:	SAME AS ABOVE
Facility ID:	7563
Leak ID#:	1467
Date Discovered:	7/12/89
Media Affected:	SOIL
Description / Comment:	F NAME: MILITARY DEPT KENT ARMORY (1939) FACILITY COUNTY: KING



* VISTA address includes enhanced city and ZIP.
For more information call VISTA Information Solutions, Inc. at 1 - 800 - 767 - 0403.

Description / Comment:	ECOLOGY REGION: NW
Description / Comment:	RELEASE STATUS INFO: CLEANUP STARTED 7/12/89

STATE LUST - State Leaking Underground Storage Tank / SRC# 4979	EPA/Agency ID:	N/A

Agency Address:	SAME AS ABOVE
Facility ID:	7563
Leak ID#:	3134
Date Discovered:	4/1/92
Media Affected:	SOIL
Description / Comment:	F NAME: MILITARY DEPT KENT ARMORY (1989) FACILITY COUNTY: KING
Description / Comment:	ECOLOGY REGION: NW
Description / Comment:	RELEASE STATUS INFO: CLEANUP STARTED 6/1/95

STATE UST - State Underground Storage Tank / SRC# 4980	Agency ID:	7563

Agency Address:	ORGANIZATIONAL MAINTENANCE SHOP5 24410 MILITARY RD KENT, WA 98032
Underground Tanks:	3
Aboveground Tanks:	NOT REPORTED
Tanks Removed:	NOT REPORTED

Tank ID:	WA065-1U	Tank Status:	ACTIVE/IN SERVICE
Tank Contents:	UNLEADED GAS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	11	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	1000 (GALLONS)	Tank Material:	STEEL
Tank ID:	WA065-2U	Tank Status:	ACTIVE/IN SERVICE
Tank Contents:	DIESEL	Leak Monitoring:	NOT AVAILABLE
Tank Age:	11	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	5000 (GALLONS)	Tank Material:	STEEL
Tank ID:	WA065-4U	Tank Status:	CLOSED IN PLACE
Tank Contents:	OTHER	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	NOT AVAILABLE

VISTA Address*:	MILITARY DEPARTMENT - KENT ARMORY 199 24410 MILITARY ROAD KENT, WA 98032	VISTA ID#:	4267261
		Distance/Direction:	0.48 MI / NE
		Plotted as:	Point

Map ID **11B**

WA Toxics - Washington Toxics / SRC# 5108	EPA/Agency ID:	N/A

Agency Address:	SAME AS ABOVE
Region:	NORTHWEST
State Detail Description:	NO
Contact:	NOT REPORTED
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:6/18/92
Description:	MEDIA:SOIL
Description:	REPORT TYPE:FINAL
Description:	ISSUE OF SITE REGISTER:92-40

WA Toxics - Washington Toxics / SRC# 5108	EPA/Agency ID:	N/A

Agency Address:	SAME AS ABOVE
Region:	NORTHWEST
State Detail Description:	NO
Contact:	NOT REPORTED

Region:	NORTHWEST
State Detail Description:	NO
Contact:	NOT REPORTED
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:6/18/92
Description:	MEDIA:SOIL
Description:	REPORT TYPE:INTERIM
Description:	ISSUE OF SITE REGISTER:92-39
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:8/27/92
Description:	MEDIA:SOIL
Description:	REPORT TYPE:INTERIM
Description:	ISSUE OF SITE REGISTER:92-35

WA Toxics - Washington Toxics / SRC# 5108	EPA/Agency ID:	N/A

Agency Address:	SAME AS ABOVE
Region:	NORTHWEST
State Detail Description:	NO
Contact:	NOT REPORTED
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:6/18/92
Description:	MEDIA:SOIL
Description:	REPORT TYPE:INTERIM
Description:	ISSUE OF SITE REGISTER:92-39
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:8/27/92
Description:	MEDIA:SOIL
Description:	REPORT TYPE:INTERIM
Description:	ISSUE OF SITE REGISTER:92-35

VISTA Address*:	RANGER FIBERGLASS BOATS 25802 PACIFIC HWY SOUTH KENT, WA 98032	VISTA ID#:	1847850
		Distance/Direction:	0.49 MI / SW
		Plotted as:	Point

Map ID 12

STATE UST - State Underground Storage Tank / SRC# 4980	Agency ID:	1413

Agency Address:	SAME AS ABOVE
Underground Tanks:	1
Aboveground Tanks:	NOT REPORTED
Tanks Removed:	1

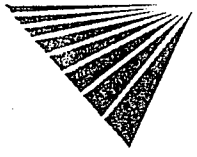
Tank ID:	1U	Tank Status:	REMOVED
Tank Contents:	HAZARDOUS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	STEEL

VISTA Address*:	ARCO 4484 24001 PACIFIC COAST HWY KENT, WA 98032	VISTA ID#:	1847895
		Distance/Direction:	0.50 MI / N
		Plotted as:	Point

Map ID 13A

STATE LUST - State Leaking Underground Storage Tank / SRC# 4979	EPA/Agency ID:	N/A

Agency Address:	SAME AS ABOVE
Facility ID:	3759
Leak ID#:	423133
Date Discovered:	7/1/97



* VISTA address includes enhanced city and ZIP.
For more information call VISTA Information Solutions, Inc. at 1 - 800 - 767 - 0403.

Media Affected:	SOIL
Description / Comment:	FACILITY COUNTY: KING
Description / Comment:	ECOLOGY REGION: NW
Description / Comment:	RELEASE STATUS INFO: MONITORING 7/11/97

STATE UST - State Underground Storage Tank / SRC# 4980				Agency ID:	8769
Agency Address:	SAME AS ABOVE				
Underground Tanks:	3				
Aboveground Tanks:	NOT REPORTED				
Tanks Removed:	NOT REPORTED				
Tank ID:	1U		Tank Status:	ACTIVE/IN SERVICE	
Tank Contents:	LEADED GAS		Leak Monitoring:	NOT AVAILABLE	
Tank Age:	10		Tank Piping:	NOT AVAILABLE	
Tank Size (Units):	10000 (GALLONS)		Tank Material:	FIBERGLASS REINFORCED PLASTIC	
Tank ID:	2U		Tank Status:	ACTIVE/IN SERVICE	
Tank Contents:	UNLEADED GAS		Leak Monitoring:	NOT AVAILABLE	
Tank Age:	10		Tank Piping:	NOT AVAILABLE	
Tank Size (Units):	10000 (GALLONS)		Tank Material:	FIBERGLASS REINFORCED PLASTIC	
Tank ID:	3U		Tank Status:	ACTIVE/IN SERVICE	
Tank Contents:	UNLEADED GAS		Leak Monitoring:	NOT AVAILABLE	
Tank Age:	10		Tank Piping:	NOT AVAILABLE	
Tank Size (Units):	10000 (GALLONS)		Tank Material:	FIBERGLASS REINFORCED PLASTIC	

VISTA Address*:	ARCO #4484 24001 PACIFIC HWY S KENT, WA 98032	VISTA ID#:	3756512	Map ID
		Distance/Direction:	0.51 MI / N	13A
		Plotted as:	Point	

RCRA-SmGen - RCRA-Small Generator / SRC# 4467		EPA ID:	WAD988514733
Agency Address:	SAME AS ABOVE		
Generator Class:	Generates 100 kg./month but less than 1000 kg./month of non-acutely hazardous waste		

VISTA Address*:	MIDWAY MUFFLER RADIATOR 23898 PACIFIC HWY S KENT, WA 98032	VISTA ID#:	3272296	Map ID
		Distance/Direction:	0.53 MI / N	13B
		Plotted as:	Point	

RCRA-SmGen - RCRA-Small Generator / SRC# 4467		EPA ID:	WAD988490348
Agency Address:	SAME AS ABOVE		
Generator Class:	Generates 100 kg./month but less than 1000 kg./month of non-acutely hazardous waste		

VISTA Address*:	UNOCAL #6211 23845 PACIFIC HWY S. KENT, WA 98031	VISTA ID#:	4267354	Map ID
		Distance/Direction:	0.55 MI / N	13B
		Plotted as:	Point	

WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A
Agency Address:	SAME AS ABOVE		
Region:	NORTHWEST		
State Detail Description:	NO		
Contact:	NOT REPORTED		
Description:	WASTE:PETROLEUM PRODUCT		
Description:	DATE ECOLOGY RECEIVED REPORT:4/21/92		
Description:	MEDIA:SOIL		
Description:	REPORT TYPE:INTERIM		
Description:	ISSUE OF SITE REGISTER:92-29		
Description:	WASTE:PETROLEUM PRODUCT		

Description:	*DATE ECOLOGY RECEIVED REPORT:9/21/93*
Description:	*MEDIA:GROUNDWATER*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:93-13*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:3/18/94*
Description:	*MEDIA:GROUNDWATER*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:93-21*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:12/7/94*
Description:	*MEDIA:GROUNDWATER*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:94-03*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:10/13/92*
Description:	*MEDIA:GROUNDWATER*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:92-36*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:7/5/95*
Description:	*MEDIA:GROUNDWATER*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:94-05*

VISTA Address*:	**6211** **23845 PACIFIC HWY SO** **KENT, WA 98032**	VISTA ID#: Distance/Direction: Plotted as:	1847846 0.55 MI / N Point

Map ID **13B**

STATE LUST - State Leaking Underground Storage Tank / SRC# 4979		EPA/Agency ID:	N/A
Agency Address:	*6211* *23845 PACIFIC HWY SO* *KENT, WA 98031*		
Facility ID:	*8506*		
Leak ID#:	*3050*		
Date Discovered:	*3/9/89*		
Media Affected:	*GROUND WATER*		
Description / Comment:	*F NAME: UNOCAL STATION # 6211 FACILITY COUNTY: KING*		
Description / Comment:	*ECOLOGY REGION: NW*		
Description / Comment:	*RELEASE STATUS INFO: CLEANUP STARTED 6/1/95*		
STATE UST - State Underground Storage Tank / SRC# 4980		Agency ID:	8506
Agency Address:	*6211* *23845 PACIFIC HWY SO* *KENT, WA 98031*		
Underground Tanks:	*3*		
Aboveground Tanks:	*NOT REPORTED*		
Tanks Removed:	*3*		

Tank ID:	TK 1U	Tank Status:	REMOVED
Tank Contents:	UNLEADED GAS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	NOT AVAILABLE
Tank ID:	TK 2U	Tank Status:	REMOVED
Tank Contents:	UNLEADED GAS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	NOT AVAILABLE
Tank ID:	TK 4U	Tank Status:	REMOVED
Tank Contents:	USED OIL, WASTE OIL	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	NOT AVAILABLE

				Map ID
VISTA Address*:	UNOCAL 23845 PACIFIC HIGHWAY SOUTH KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	200147897 0.55 MI / N Point	13B
ERNS - Emergency Response Notification System / SRC# 4939		EPA/Agency ID:	N/A	

Agency Address:	UNOCAL 23845 PACIFIC HIGHWAY SOUTH KENT, WA
Spill Date Time:	OCTOBER 12, 1987 08:00:00 AM
Spill Location:	23845 PACIFIC HIGHWAY SOUTH
Discharger Org:	UNOCAL
Material Spilled:	UNLEADED GASOLINE, 3000.00 (GAL)
Waterway Affected:	SOIL
Fields Not Reported:	Case Number, Source Agency, Discharger Name, Discharger Phone

Air Release:	Land Release:	Water Release:	Ground Release:	Facility Release:	Other Release:
NO	YES	NO	NO	NO	NO

				Map ID
VISTA Address*:	FLOYD R. HUNT, INC. 3219 S. 259TH PL. KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	1853224 0.59 MI / SE Point	14
WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A	

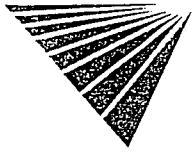
Agency Address:	SAME AS ABOVE
Region:	NORTHWEST
State Detail Description:	NO
Contact:	NOT REPORTED
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:11/16/90
Description:	MEDIA:SOIL
Description:	REPORT TYPE:INTERIM
Description:	ISSUE OF SITE REGISTER:90-17

VISTA Address*:	KENT HIGHLANDS LANDFILL 240TH MILITARY RD KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	373160 0.61 MI / NE Point

Map ID 15

SCL - State Equivalent CERCLIS List / SRC# 4901		Agency ID:	2042 WARM 0
Agency Address:	SAME AS ABOVE		
Status:	UNKNOWN		
Facility Type:	NOT AVAILABLE		
Lead Agency:	NOT AVAILABLE		
State Status:	NOT AVAILABLE		
Pollutant 1:	HALOGENATED ORGANIC COMPOUNDS		
Pollutant 2:	UNKNOWN		
Pollutant 3:	UNKNOWN		

CERCLIS / SRC# 4941		EPA ID:	WAD980639462
Agency Address:	SEATTLE MUNICIPAL LANDFILL (KENT HGHLND 240TH MILITARY RD KENT, WA 98031		
EPA Region:	10		
Congressional District:	9		
Federal Facility:	NOT A FEDERAL FACILITY		
Facility Ownership:	PRIVATE		
Site Incident Category:	unknown		
Federal Facility Docket:	Agency Code ( )		
NPL Status:	CURRENTLY ON FINAL NPL		
Incident Type:	Unknown		
Proposed NPL Update #:	9		
Final NPL Update #:	0		
Financial Management System ID:	10A3		
Latitude:	4723350		
Longitude:	12217000		
Lat/Long Source:	RESEARCHED BY THE REGION AND MANUALLY ENTERED		
Lat/Long Accuracy:	Unknown		
Dioxin Tier:	Unknown		
USGS Hydro Unit:	17110013		
RCRA Indicator:	Unknown		
Alias Name:	SEATTLE MUNICIPAL LANDFILL (KENT HIGHLAN		
Alias Street:	NOT REPORTED		
Alias City:	KING	Alias Latitude:	4723350
Alias Zip:	NOT REPORTED	Alias Longitude:	12217000
Alias State:	WA		
Alias Description:	NOT REPORTED		
Alias Name:	SEATTLE, CY OF, KENT HIGHLANDS DSPL SITE		
Alias Street:	NOT REPORTED		
Alias City:	NOT REPORTED	Alias Latitude:	0
Alias Zip:	NOT REPORTED	Alias Longitude:	0
Alias State:	WA		
Alias Description:	NOT REPORTED		
Alias Name:	KENT-HIGHLANDS DISPOSAL SITE		
Alias Street:	NOT REPORTED		



* VISTA address includes enhanced city and ZIP.
For more information call VISTA Information Solutions, Inc. at 1 - 800 - 767 - 0403.

PROPERTY AND THE ADJACENT AREA (within 5/8 mile) CONT.

Alias City:	NOT REPORTED	Alias Latitude:	0
Alias Zip:	NOT REPORTED	Alias Longitude:	0
Alias State:	WA		
Alias Description:	NOT REPORTED		
Alias Name:	MILITARY ROAD LDFL		
Alias Street:	NOT REPORTED		
Alias City:	NOT REPORTED	Alias Latitude:	0
Alias Zip:	NOT REPORTED	Alias Longitude:	0
Alias State:	WA		
Alias Description:	NOT REPORTED		
Unit Id:	0		
Unit Name:	SITEWIDE		
Unit Id:	1		
Unit Name:	NOT REPORTED		
Type:	DISCOVERY	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	Unknown	Actual Completion Date:	JUNE 1, 1981
Type:	HAZARD RANKING SYSTEM SCORE	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	Unknown	Actual Completion Date:	AUGUST 5, 1987
Type:	NPL DELETION	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	Unknown	Actual Completion Date:	NOT REPORTED
Type:	FINAL LISTING ON NPL	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	Unknown	Actual Completion Date:	AUGUST 30, 1990
Type:	PROPOSED FOR NPL	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	Unknown	Actual Completion Date:	JUNE 24, 1988
Type:	PRELIMINARY ASSESSMENT	Lead Agency:	STATE, FUND FINANCED
Qualifier:	HIGHER PRIORITY	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	DECEMBER 20, 1984
Plan Status:	Unknown	Actual Completion Date:	MAY 19, 1986
Type:	REMOVAL INVESTIGATION AT NPL SITES	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	NOT REPORTED
Plan Status:	PRIMARY	Actual Completion Date:	AUGUST 31, 1990
Type:	REMOVAL INVESTIGATION AT NPL SITES	Lead Agency:	EPA FUND-FINANCED
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	APRIL 30, 1992
Plan Status:	Unknown	Actual Completion Date:	APRIL 30, 1992
Type:	SCREENING SITE INSPECTION	Lead Agency:	EPA FUND-FINANCED
Qualifier:	HIGHER PRIORITY	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	AUGUST 5, 1987
Plan Status:	Unknown	Actual Completion Date:	AUGUST 5, 1987

PROPERTY AND THE ADJACENT AREA (within 5/8 mile) CONT.

Type:	COMBINED RI/FS	Lead Agency:	PRP LEAD UNDER STATE
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	MAY 26, 1987
Plan Status:	PRIMARY	Actual Completion Date:	MAY 26, 1992
Type:	OTHER EVENT	Lead Agency:	PRP LEAD UNDER STATE
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	DECEMBER 15, 1986
Plan Status:	Unknown	Actual Completion Date:	MARCH 15, 1987
Type:	REMEDIAL ACTION	Lead Agency:	PRP LEAD UNDER STATE
Qualifier:	UNKNOWN	Category:	Unknown
Name:	NOT REPORTED	Actual Start Date:	MAY 26, 1987
Plan Status:	PRIMARY	Actual Completion Date:	JUNE 30, 1995

Name:	Lead Agency:	Actual Start Date:	Actual Completion Date:
NOT REPORTED	STATE ENFORCEMENT	UNKNOWN	UNKNOWN
NOT REPORTED	FEDERAL ENFORCEMENT	UNKNOWN	UNKNOWN
NOT REPORTED	STATE ENFORCEMENT	NOT REPORTED	UNKNOWN
NOT REPORTED	STATE ENFORCEMENT	UNKNOWN	UNKNOWN
NOT REPORTED	FEDERAL ENFORCEMENT	UNKNOWN	UNKNOWN
NOT REPORTED	STATE ENFORCEMENT	NOT REPORTED	UNKNOWN

NPL - National Priority List / SRC# 5074	EPA ID:	WAD980639462

Agency Address:	SEATTLE MUNICIPAL LANDFILL (KENT HIGHLA 240TH MILITARY RD KENT, WA 98031
EPA Region:	0
Congressional District:	0
Federal Facility:	Agency Code ( )
Facility Ownership:	NOT AVAILABLE
Site Incident Category:	unknown
Federal Facility Docket:	Agency Code ( )
NPL Status:	UNKNOWN
Incident Type:	Unknown
Proposed NPL Update #:	0
Final NPL Update #:	0
Financial Management System ID:	NOT REPORTED
Latitude:	0
Longitude:	0
Lat/Long Source:	Agency Code ( )
Lat/Long Accuracy:	Unknown
Dioxin Tier:	Unknown
USGS Hydro Unit:	0
RCRA Indicator:	Unknown
Alias Name:	KENT-HIGHLANDS DISPOSAL SITE
Alias Street:	NOT REPORTED
Alias City:	NOT REPORTED
Alias Zip:	NOT REPORTED
Alias State:	NOT REPORTED
Alias Latitude:	0
Alias Longitude:	0
Alias Name:	MILITARY ROAD LDFL
Alias Street:	NOT REPORTED
Alias City:	NOT REPORTED
Alias Zip:	NOT REPORTED
Alias State:	NOT REPORTED
Alias Latitude:	0
Alias Longitude:	0
Alias Name:	SEATTLE, CY OF, KENT HIGHLANDS DSPL SITE

PROPERTY AND THE ADJACENT AREA (within 5/8 mile) CONT.

Alias Street:	NOT REPORTED		
Alias City:	NOT REPORTED	Alias Latitude:	0
Alias Zip:	NOT REPORTED	Alias Longitude:	0
Alias State:	NOT REPORTED		
Alias Name:	SEATTLE MUNICIPAL LANDFILL (KENT HIGHLAN		
Alias Street:	NOT REPORTED		
Alias City:	KING	Alias Latitude:	4723350
Alias Zip:	NOT REPORTED	Alias Longitude:	12217000
Alias State:	NOT REPORTED		

SITES IN THE SURROUNDING AREA (within 5/8 - 3/4 mile)

VISTA Address*:	MIDWAY CHEVRON 25915 PACIFIC HWY SO SEATTLE, WA 98198	VISTA ID#:	7821757
		Distance/Direction:	0.64 MI / SW
		Plotted as:	Point

Map ID: 16

STATE UST - State Underground Storage Tank / SRC# 4980		Agency ID:	455632
Agency Address:	MIDWAY CHEVRON 25915 PACIFIC HWY SO DES MOINES, WA 98198		
Underground Tanks:	2		
Aboveground Tanks:	NOT REPORTED		
Tanks Removed:	NOT REPORTED		
Tank ID:	1U	Tank Status:	ACTIVE/IN SERVICE
Tank Contents:	UNLEADED GAS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	NOT REPORTED	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	FRP CLAD STEEL
Tank ID:	2U	Tank Status:	ACTIVE/IN SERVICE
Tank Contents:	UNLEADED GAS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	NOT REPORTED	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	FRP CLAD STEEL

VISTA Address*:	MURRAY'S COLLISION CENTER 23608 30TH AVENUE SOUTH KENT, WA 98032	VISTA ID#:	7312283
		Distance/Direction:	0.70 MI / N
		Plotted as:	Point

Map ID: 17A

STATE LUST - State Leaking Underground Storage Tank / SRC# 4979		EPA/Agency ID:	N/A
Agency Address:	MURRAY'S COLLISION CENTER 23608 30TH AVENUE SOUTH KENT, WA		
Facility ID:	433774		
Leak ID#:	433790		
Date Discovered:	10/7/97		
Media Affected:	SOIL		
Description / Comment:	F NAME: MURRAY'S COLLISION CENTER FACILITY COUNTY: KING		
Description / Comment:	ECOLOGY REGION: NW		
Description / Comment:	RELEASE STATUS INFO: AWAITING CLEANUP 10/6/97		

STATE UST - State Underground Storage Tank / SRC# 4980		Agency ID:	433774
Agency Address:	*MURRAY'S COLLISION CENTER 23608 30TH AVENUE SOUTH KENT, WA*		
Underground Tanks:	*2*		
Aboveground Tanks:	*NOT REPORTED*		
Tanks Removed:	*2*		

Tank ID:	*1GASU*	Tank Status:	*REMOVED*
Tank Contents:	*UNLEADED GAS*	Leak Monitoring:	*NOT AVAILABLE*
Tank Age:	*34*	Tank Piping:	*NOT AVAILABLE*
Tank Size (Units):	*NOT REPORTED (NOT AVAILABLE)*	Tank Material:	*STEEL*
Tank ID:	*2U*	Tank Status:	*REMOVED*
Tank Contents:	*HEATING OIL*	Leak Monitoring:	*NOT AVAILABLE*
Tank Age:	*NOT REPORTED*	Tank Piping:	*NOT AVAILABLE*
Tank Size (Units):	*NOT REPORTED (NOT AVAILABLE)*	Tank Material:	*STEEL*

VISTA Address*:	**MURRAY'S COLLISION CENTER 23608 30TH AVE. S. SEATTLE, WA 98198**	VISTA ID#:	7497975
		Distance/Direction:	0.70 MI / N
		Plotted as:	Point

Map ID **17A**

WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A
Agency Address:	*MURRAY'S COLLISION CENTER 23608 30TH AVE. S. DES MOINES, WA 98198*		
Region:	*NORTHWEST*		
State Detail Description:	*NO*		
Contact:	*NOT REPORTED*		
Description:	*WASTE:PETROLEUM PRODUCT*		
Description:	*DATE ECOLOGY RECEIVED REPORT:12/5/97*		
Description:	*MEDIA:SOIL*		
Description:	*REPORT TYPE:INTERIM*		
Description:	*ISSUE OF SITE REGISTER:95-15*		
Description:	*WASTE:PETROLEUM PRODUCT*		
Description:	*DATE ECOLOGY RECEIVED REPORT:7/28/98*		
Description:	*MEDIA:SOIL*		
Description:	*REPORT TYPE:FINAL*		
Description:	*ISSUE OF SITE REGISTER:98-06*		

VISTA Address*:	**MINIT-LUBE #1114 23610 PACIFIC HWY SOUTH KENT, WA 98032**	VISTA ID#:	1847845
		Distance/Direction:	0.72 MI / N
		Plotted as:	Point

Map ID **17B**

STATE UST - State Underground Storage Tank / SRC# 4980		Agency ID:	97239
Agency Address:	*SAME AS ABOVE*		
Underground Tanks:	*3*		
Aboveground Tanks:	*NOT REPORTED*		
Tanks Removed:	*3*		

Tank ID:	*1U*	Tank Status:	*REMOVED*
Tank Contents:	*OTHER*	Leak Monitoring:	*NOT AVAILABLE*
Tank Age:	*11*	Tank Piping:	*NOT AVAILABLE*
Tank Size (Units):	*NOT REPORTED (NOT AVAILABLE)*	Tank Material:	*STEEL*

Tank ID:	2U	Tank Status:	REMOVED
Tank Contents:	OTHER	Leak Monitoring:	NOT AVAILABLE
Tank Age:	11	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	STEEL
Tank ID:	3U	Tank Status:	REMOVED
Tank Contents:	USED OIL, WASTE OIL	Leak Monitoring:	NOT AVAILABLE
Tank Age:	11	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	1100 (GALLONS)	Tank Material:	STEEL

VISTA Address*:	CC HIGHLINE COMMUNITY COLLEGE 2400 S 240TH ST. SEATTLE, WA 98198	VISTA ID#:	6783911
		Distance/Direction:	0.72 MI / NW
		Plotted as:	Point

Map ID 18

STATE LUST - State Leaking Underground Storage Tank / SRC# 4979	EPA/Agency ID: N/A

Agency Address:	CC HIGHLINE COMMUNITY COLLEGE 2400 S 240TH ST. DES MOINES, WA 981989800
Facility ID:	11291
Leak ID#:	2733
Date Discovered:	12/6/91
Media Affected:	SOIL
Description / Comment:	F NAME: HIGHLINE COMMUNITY COLLEGE FACILITY COUNTY: KING
Description / Comment:	ECOLOGY REGION: NW
Description / Comment:	RELEASE STATUS INFO: CLEANUP STARTED 12/6/91

VISTA Address*:	CC HIGHLINE COMMUNITY COLLEGE 2400 S 240TH ST. SEATTLE, WA 98198	VISTA ID#:	4865299
		Distance/Direction:	0.72 MI / NW
		Plotted as:	Point

Map ID 18

STATE UST - State Underground Storage Tank / SRC# 4980	Agency ID: 11291

Agency Address:	CC HIGHLINE COMMUNITY COLLEGE 2400 S 240TH ST. DES MOINES, WA 98198
Underground Tanks:	4
Aboveground Tanks:	NOT REPORTED
Tanks Removed:	3

Tank ID:	1U	Tank Status:	REMOVED
Tank Contents:	USED OIL, WASTE OIL	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	1100 (GALLONS)	Tank Material:	NOT AVAILABLE
Tank ID:	2U	Tank Status:	REMOVED
Tank Contents:	HEATING OIL	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	NOT AVAILABLE
Tank ID:	3U	Tank Status:	REMOVED
Tank Contents:	UNLEADED GAS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	NOT AVAILABLE
Tank ID:	4U	Tank Status:	EXEMPT
Tank Contents:	HEATING OIL	Leak Monitoring:	NOT AVAILABLE
Tank Age:	6	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	FIBERGLASS REINFORCED PLASTIC

VISTA Address*:	SEA-TAC ROOFING SUPPLY INC. 2427 SOUTH 260 TH STREET KENT, WA 98032	VISTA ID#:	1840957	Map ID 19
		Distance/Direction:	0.72 MI / SW	
		Plotted as:	Point	

STATE UST - State Underground Storage Tank / SRC# 4980		Agency ID:	97260
Agency Address:	SAME AS ABOVE		
Underground Tanks:	1		
Aboveground Tanks:	NOT REPORTED		
Tanks Removed:	1		
Tank ID:	1U	Tank Status:	REMOVED
Tank Contents:	OTHER	Leak Monitoring:	NOT AVAILABLE
Tank Age:	34	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	NOT REPORTED (NOT AVAILABLE)	Tank Material:	STEEL

VISTA Address*:	SHELL 260TH PACIFIC HWY S. DES MOINES, WA 98198	VISTA ID#:	1856070	Map ID 19
		Distance/Direction:	0.73 MI / SW	
		Plotted as:	Point	

WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A
Agency Address:	SAME AS ABOVE		
Region:	NORTHWEST		
State Detail Description:	NO		
Contact:	NOT REPORTED		
Description:	WASTE:PETROLEUM PRODUCT		
Description:	DATE ECOLOGY RECEIVED REPORT:4/12/91		
Description:	MEDIA:GROUNDWATER		
Description:	REPORT TYPE:INTERIM		
Description:	ISSUE OF SITE REGISTER:91-27		

VISTA Address*:	7-ELEVEN FOOD STORE #2303-18758J 26007 PACIFIC HWY S KENT, WA 98032	VISTA ID#:	5749989	Map ID 19
		Distance/Direction:	0.74 MI / SW	
		Plotted as:	Point	

STATE LUST - State Leaking Underground Storage Tank / SRC# 4979		EPA/Agency ID:	N/A
Agency Address:	SAME AS ABOVE		
Facility ID:	8606		
Leak ID#:	324135		
Date Discovered:	11/16/95		
Media Affected:	SOIL		
Description / Comment:	F NAME: SOUTHLAND 7-11 # 18758 FACILITY COUNTY: KING		
Description / Comment:	ECOLOGY REGION: NW		
Description / Comment:	RELEASE STATUS INFO: CLEANUP STARTED 11/27/95		

STATE UST - State Underground Storage Tank / SRC# 4980		Agency ID:	8606
Agency Address:	SAME AS ABOVE		
Underground Tanks:	3		
Aboveground Tanks:	NOT REPORTED		
Tanks Removed:	NOT REPORTED		
Tank ID:	NOLU	Tank Status:	ACTIVE/IN SERVICE
Tank Contents:	UNLEADED GAS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	20	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	10000 (GALLONS)	Tank Material:	STEEL

Tank ID:	REGU	Tank Status:	ACTIVE/IN SERVICE
Tank Contents:	UNLEADED GAS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	20	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	10000 (GALLONS)	Tank Material:	STEEL
Tank ID:	SNLU	Tank Status:	ACTIVE/IN SERVICE
Tank Contents:	UNLEADED GAS	Leak Monitoring:	NOT AVAILABLE
Tank Age:	20	Tank Piping:	NOT AVAILABLE
Tank Size (Units):	10000 (GALLONS)	Tank Material:	STEEL

WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A
Agency Address:	SOUTHLAND 7-11 #18758 26008 PACIFIC HWY S. KENT, WA 98032		
Region:	NORTHWEST		
State Detail Description:	NO		
Contact:	NOT REPORTED		
Description:	WASTE:PETROLEUM PRODUCT		
Description:	DATE ECOLOGY RECEIVED REPORT:12/14/95		
Description:	MEDIA:SOIL		
Description:	REPORT TYPE:INTERIM		
Description:	ISSUE OF SITE REGISTER:94-41		

VISTA Address*:	SHELL #246 4060 1209 26010 PACIFIC HWY S. KENT, WA 98032	VISTA ID#: Distance/Direction: Plotted as:	4105349 0.75 MI / SW Point

Map ID **19**

WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A
Agency Address:	SAME AS ABOVE		
Region:	NORTHWEST		
State Detail Description:	NO		
Contact:	NOT REPORTED		
Description:	WASTE:PETROLEUM PRODUCT		
Description:	DATE ECOLOGY RECEIVED REPORT:7/17/97		
Description:	MEDIA:GROUNDWATER		
Description:	MEDIA:SOIL		
Description:	REPORT TYPE:INTERIM		
Description:	ISSUE OF SITE REGISTER:95-03		
Description:	WASTE:PETROLEUM PRODUCT		
Description:	DATE ECOLOGY RECEIVED REPORT:7/17/97		
Description:	MEDIA:GROUNDWATER		
Description:	MEDIA:SOIL		
Description:	REPORT TYPE:FINAL		
Description:	ISSUE OF SITE REGISTER:95-03		
Description:	WASTE:PETROLEUM PRODUCT		
Description:	DATE ECOLOGY RECEIVED REPORT:9/29/97		
Description:	MEDIA:GROUNDWATER		
Description:	MEDIA:SOIL		
Description:	REPORT TYPE:INTERIM		
Description:	ISSUE OF SITE REGISTER:95-13		
Description:	WASTE:PETROLEUM PRODUCT		
Description:	DATE ECOLOGY RECEIVED REPORT:1/9/98		
Description:	MEDIA:GROUNDWATER		
Description:	MEDIA:SOIL		

SITES IN THE SURROUNDING AREA (within 5/8 - 3/4 mile) CONT.

Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:2/14/97*
Description:	*MEDIA:GROUNDWATER*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:94-48*

				Map ID
VISTA Address*:	**OH'S MART** **26010 PACIFIC HWY S** **KENT, WA 98032**	VISTA ID#: Distance/Direction: Plotted as:	7248151 0.75 MI / SW Point	**19**
STATE LUST - State Leaking Underground Storage Tank / SRC# 4979		EPA/Agency ID:	N/A	

Agency Address:	*SAME AS ABOVE*
Facility ID:	*200791*
Leak ID#:	*1485*
Date Discovered:	*7/28/89*
Media Affected:	*GROUND WATER*
Description / Comment:	*F NAME: SHELL 246 4060 1209 FACILITY COUNTY: KING*
Description / Comment:	*ECOLOGY REGION: NW*
Description / Comment:	*RELEASE STATUS INFO: MONITORING 7/31/89*

STATE UST - State Underground Storage Tank / SRC# 4980	Agency ID:	200791

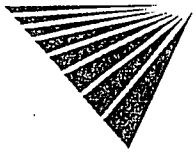
Agency Address:	*SAME AS ABOVE*
Underground Tanks:	*2*
Aboveground Tanks:	*NOT REPORTED*
Tanks Removed:	*NOT REPORTED*

Tank ID:	*230946U*	Tank Status:	*ACTIVE/IN SERVICE*
Tank Contents:	*LEADED GAS*	Leak Monitoring:	*NOT AVAILABLE*
Tank Age:	*1*	Tank Piping:	*NOT AVAILABLE*
Tank Size (Units):	*NOT REPORTED (NOT AVAILABLE)*	Tank Material:	*COATED STEEL*
Tank ID:	*231046U*	Tank Status:	*ACTIVE/IN SERVICE*
Tank Contents:	*LEADED GAS*	Leak Monitoring:	*NOT AVAILABLE*
Tank Age:	*1*	Tank Piping:	*NOT AVAILABLE*
Tank Size (Units):	*NOT REPORTED (NOT AVAILABLE)*	Tank Material:	*COATED STEEL*

SITES IN THE SURROUNDING AREA (within 3/4 - 1 mile)

				Map ID
VISTA Address*:	**MIDWAY AUTO REPAIR** **23452 30TH AVE** **DES MOINES, WA**	VISTA ID#: Distance/Direction: Plotted as:	6607217 0.76 MI / N Point	**17**
STATE LUST - State Leaking Underground Storage Tank / SRC# 4979		EPA/Agency ID:	N/A	

Agency Address:	*SAME AS ABOVE*
Facility ID:	*200724*
Leak ID#:	*2133*
Date Discovered:	*12/17/90*
Media Affected:	*SOIL*
Description / Comment:	*F NAME: MIDWAY AUTO BODY REPAIR FACILITY COUNTY: KING*
Description / Comment:	*ECOLOGY REGION: NW*
Description / Comment:	*RELEASE STATUS INFO: CLEANUP STARTED 5/21/95*



SITES IN THE SURROUNDING AREA (within 3/4 - 1 mile) CONT.

VISTA Address*:	MIDWAY AUTO REPAIR 23452 30TH AVE. S. SEATTLE, WA 98198	VISTA ID#:	7247899	Map ID 17
		Distance/Direction:	0.76 MI / N	
		Plotted as:	Point	
WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A	

Agency Address:	*MIDWAY AUTO REPAIR 23452 30TH AVE. S. DES MOINES, WA 98198*
Region:	*NORTHWEST*
State Detail Description:	*NO*
Contact:	*NOT REPORTED*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:6/6/91*
Description:	*MEDIA:SOIL*
Description:	*ISSUE OF SITE REGISTER:91-31*

VISTA Address*:	DP FUELS INC. #63-232-0503 23419 PACIFIC HWY S KENT, WA 98032	VISTA ID#:	6887918	Map ID 20
		Distance/Direction:	0.85 MI / N	
		Plotted as:	Point	
STATE LUST - State Leaking Underground Storage Tank / SRC# 4979		EPA/Agency ID:	N/A	

Agency Address:	*DP FUELS INC. #63-232-0503 23419 PACIFIC HWY S DES MOINES, WA 981989837*
Facility ID:	*3363*
Leak ID#:	*2882*
Date Discovered:	*10/3/90*
Media Affected:	*GROUND WATER*
Description / Comment:	*F NAME: SHELL/TEXACO/DP FACILITY COUNTY: KING*
Description / Comment:	*ECOLOGY REGION: NW*
Description / Comment:	*RELEASE STATUS INFO: CLEANUP STARTED 10/31/94*

SITES IN THE SURROUNDING AREA (within 1 - 1 1/2 miles)

No Records Found

UNMAPPED SITES

VISTA Address*:	SHELL/TEXACO 23419 PACIFIC HWY S. TUKWILA, WA 98188	VISTA ID#:	4267353
WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A

Agency Address:	*SAME AS ABOVE*
Region:	*NORTHWEST*
State Detail Description:	*NO*
Contact:	*NOT REPORTED*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:5/19/97*
Description:	*MEDIA:GROUNDWATER*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:95-07*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*MEDIA:GROUNDWATER*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:95-12*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:11/20/97*
Description:	*MEDIA:GROUNDWATER*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:95-15*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:11/6/97*
Description:	*MEDIA:GROUNDWATER*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:95-15*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:2/4/98*
Description:	*MEDIA:GROUNDWATER*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:98-01*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:8/16/94*
Description:	*MEDIA:GROUNDWATER*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:93-37*
Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:11/16/94*
Description:	*MEDIA:GROUNDWATER*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:93-41*
Description:	*WASTE:PETROLEUM PRODUCT*

Description:	DATE ECOLOGY RECEIVED REPORT:5/31/95
Description:	MEDIA:GROUNDWATER
Description:	MEDIA:SOIL
Description:	REPORT TYPE:INTERIM
Description:	ISSUE OF SITE REGISTER:94-05
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:5/16/91
Description:	MEDIA:GROUNDWATER
Description:	MEDIA:SOIL
Description:	ISSUE OF SITE REGISTER:91-30
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:3/18/92
Description:	MEDIA:GROUNDWATER
Description:	REPORT TYPE:INTERIM
Description:	ISSUE OF SITE REGISTER:92-21
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:11/3/93
Description:	MEDIA:GROUNDWATER
Description:	MEDIA:SOIL
Description:	REPORT TYPE:INTERIM
Description:	ISSUE OF SITE REGISTER:93-13
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:6/4/92
Description:	MEDIA:SOIL
Description:	REPORT TYPE:INTERIM
Description:	ISSUE OF SITE REGISTER:92-28
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Description:	DATE ECOLOGY RECEIVED REPORT:2/11/93
Description:	MEDIA:GROUNDWATER
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Description:	ISSUE OF SITE REGISTER:92-45
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:7/10/91
Description:	MEDIA:GROUNDWATER
Description:	REPORT TYPE:INTERIM
Description:	ISSUE OF SITE REGISTER:92-06
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:3/11/96
Description:	MEDIA:GROUNDWATER
Description:	MEDIA:SOIL
Description:	REPORT TYPE:INTERIM
Description:	ISSUE OF SITE REGISTER:94-25
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:7/19/96
Description:	MEDIA:GROUNDWATER
Description:	MEDIA:SOIL
Description:	REPORT TYPE:INTERIM
Description:	ISSUE OF SITE REGISTER:94-35
Description:	WASTE:PETROLEUM PRODUCT
Description:	DATE ECOLOGY RECEIVED REPORT:2/20/97

Description:	*MEDIA:GROUNDWATER*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:94-49*

WA Toxics - Washington Toxics / SRC# 5108		EPA/Agency ID:	N/A
Agency Address:	*SHELL/TEXACO (TWO REPORTS)* *23419 PACIFIC HWY S.* *TUKWILA, WA 98188*		
Region:	*NORTHWEST*		
State Detail Description:	*NO*		
Contact:	*NOT REPORTED*		

Description:	*WASTE:PETROLEUM PRODUCT*
Description:	*DATE ECOLOGY RECEIVED REPORT:10/2/96*
Description:	*MEDIA:GROUNDWATER*
Description:	*MEDIA:SOIL*
Description:	*REPORT TYPE:INTERIM*
Description:	*ISSUE OF SITE REGISTER:94-37*

SITE ASSESSMENT REPORT
(EXTENDED BY 1/2 MILE)

DESCRIPTION OF DATABASES SEARCHED

A) DATABASES SEARCHED TO 1 1/2 MILES

NPL
SRC#: 5074

VISTA conducts a database search to identify all sites within 1.5 mile of your property.
The agency release date for NPL was August, 1998.

The National Priorities List (NPL) is the EPA's database of uncontrolled or abandoned hazardous waste sites identified for priority remedial actions under the Superfund program. A site must meet or surpass a predetermined hazard ranking system score, be chosen as a state's top priority site, or meet three specific criteria set jointly by the US Dept of Health and Human Services and the US EPA in order to become an NPL site.

SPL
SRC#: 4902

VISTA conducts a database search to identify all sites within 1.5 mile of your property.
The agency release date for Confirmed Contaminated Sites Report was June, 1998.

This database is provided by the Department of Ecology, Toxics Cleanup Program. The agency may be contacted at: 360-407-7200.

CORRACTS
SRC#: 4467

VISTA conducts a database search to identify all sites within 1.5 mile of your property.
The agency release date for HWDMS/RCRIS was February, 1998.

The EPA maintains this database of RCRA facilities which are undergoing "corrective action". A "corrective action order" is issued pursuant to RCRA Section 3008 (h) when there has been a release of hazardous waste or constituents into the environment from a RCRA facility. Corrective actions may be required beyond the facility's boundary and can be required regardless of when the release occurred, even if it predates RCRA.

B) DATABASES SEARCHED TO 1 MILE

CERCLIS
SRC#: 4941

VISTA conducts a database search to identify all sites within 1 mile of your property.
The agency release date for CERCLIS was June, 1998.

The CERCLIS List contains sites which are either proposed to or on the National Priorities List(NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL. The information on each site includes a history of all pre-remedial, remedial, removal and community relations activiies or events at the site, financial funding information for the events, and unrestricted enforcement activities.

NFRAP
SRC#: 4942

VISTA conducts a database search to identify all sites within 1 mile of your property.
The agency release date for CERCLIS-NFRAP was June, 1998.

NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly, or the contamination was not serious enough to require Federal Superfund action or NPL consideration.

SCL
SRC#: 4901

VISTA conducts a database search to identify all sites within 1 mile of your property.
The agency release date for Suspected Contaminated Sites Report was June, 1998.

This database is provided by the Department of Ecology, Toxics Cleanup Program. The agency may be contacted at: 360-407-7200.

The Washington Affected Media and Contaminants Report includes sites in the following categories: (1) National Priorities List (NPL) Sites, Federal Lead; (2) National Priorities List (NPL) Sites, State Lead; (3) State Sites, Confirmed Hazardous Substances Sites (sites where the presence of hazardous substances has been confirmed by laboratory or field determinations; (4) Potential Hazardous Substance Sites, these sites have been reported to the Department of Ecology and further investigation including sampling is underway; (5) State Sites Under-going Long-Term Monitoring; and (6) Sites For Which Cleanup is Complete. This report includes some leaking underground storage tank sites.

RCRA-TSD
SRC#: 4467

VISTA conducts a database search to identify all sites within 1 mile of your property.
The agency release date for HWDMS/RCRIS was February, 1998.

The EPA's Resource Conservation and Recovery Act (RCRA) Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities database is a compilation by the EPA of facilities which report generation, storage, transportation, treatment or disposal of hazardous waste. RCRA TSDs are facilities which treat, store and/or dispose of hazardous waste.

SWLF
SRC#: 4383

VISTA conducts a database search to identify all sites within 1 mile of your property.
The agency release date for Municipal Solid Waste Facilities was January, 1998.

This database is provided by the Department of Ecology, Solid Waste Services Program. The agency may be contacted at: 360-407-6133.

The Washington Solid Waste Inventory does not provide facility locations.

LUST
SRC#: 4979

VISTA conducts a database search to identify all sites within 1 mile of your property.
The agency release date for Leaking Underground Storage Tank List was July, 1998.

This database is provided by the Department of Ecology, Toxics Cleanup Program. The agency may be contacted at: 360-407/7179 .

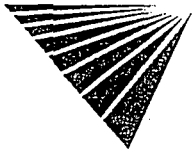
The Washington Department of Ecology Leaking Underground Storage Tank List contains some of the same sites included on the Regional lists. This list is being used because there are some "new" sites and it includes a site identification number. Because two lists are being used, sites may be reporting twice.

WA Site Register
SRC#: 5108

VISTA conducts a database search to identify all sites within 1 mile of your property.
The agency release date for Toxic Cleanup Program Site Register was August, 1998.

This database is provided by the Department of Ecology, Toxics Cleanup Program. The agency may be contacted at: 360-407-7200.

The Washington Site Register Toxics Cleanup Program report details activities related to the study and cleanup of hazardous waste sites under the Model Toxics Control Act. Note that the State of Washington cautions that information contained under the Site Description is summarized information from an Independent Report and the Department of Ecology is not responsible for the accuracy of these reports. This report includes some leaking underground storage tank sites.



C) DATABASES SEARCHED TO 3/4 MILE

UST's
SRC#: 4980

VISTA conducts a database search to identify all sites within 3/4 mile of your property.
The agency release date for Underground Storage Tank Database was July, 1998.

This database is provided by the Department of Ecology, Solid Hazardous Waste Program. The agency may be contacted at: 360-407-7179; Caution-Many states do not require registration of heating oil tanks, especially those used for residential purposes.

"D) DATABASES SEARCHED TO 5/8 MIL

ERNS
SRC#: 4939

VISTA conducts a database search to identify all sites within .625 mile of your property.
The agency release date for was July, 1998.

The Emergency Response Notification System (ERNS) is a national database used to collect information on reported releases of oil and hazardous substances. The database contains information from spill reports made to federal authorities including the EPA, the US Coast Guard, the National Response Center and the Department of transportation. A search of the database records for the period October 1986 through January 1998 revealed information regarding reported spills of oil or hazardous substances in the stated area.

RCRA-LgGen
SRC#: 4467

VISTA conducts a database search to identify all sites within .625 mile of your property.
The agency release date for HWDMS/RCRIS was February, 1998.

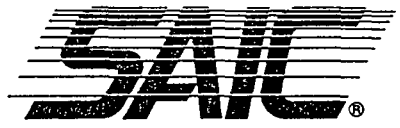
The EPA's Resource Conservation and Recovery Act (RCRA) Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities database is a compilation by the EPA of facilities which report generation, storage, transportation, treatment or disposal of hazardous waste. RCRA Large Generators are facilities which generate at least 1000 kg./month of non-acutely hazardous waste (or 1 kg./month of acutely hazardous waste).

RCRA-SmGen
SRC#: 4467

VISTA conducts a database search to identify all sites within .625 mile of your property.
The agency release date for HWDMS/RCRIS was February, 1998.

The EPA's Resource Conservation and Recovery Act (RCRA) Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities database is a compilation by the EPA of facilities which report generation, storage, transportation, treatment or disposal of hazardous waste. RCRA Small and Very Small generators are facilities which generate less than 1000 kg./month of non-acutely hazardous waste.

End of Report



Science Applications International Corporation

An Employee-Owned Company

FINAL REPORT

FOR

SITE HAZARD ASSESSMENT AT
PACIFIC HIGHWAY SOUTH - S. 248TH STREET
KENT, WASHINGTON

Submitted to:

Washington Department of Ecology
Mail Stop PV-11
Olympia, Washington 98504

Submitted by:

Science Applications International Corporation
~~626 Columbia Street N.W., Suite 1-C~~
~~Olympia, Washington 98501~~
SAIC
18706 North Creek Parkway
Suite 110
Bothell, WA 98011

Ecology Contract C0089006
Work Assignment No. SAIC 49
SAIC Project No. 1-817-00-394-20

June 21, 1991

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1.0 INTRODUCTION

This report presents the results of a Site Hazard Assessment (SHA) for the Pacific Highway South - S. 248th Street project, Kent, Washington. The Washington Department of Ecology ("Ecology") SHA process is intended to evaluate actual or potential environmental or public health hazards at a particular site. Ecology has the responsibility for assessing and ranking industrial and disposal sites that have the potential for contaminating the environment with hazardous or toxic chemicals. This process generates enough information to determine the hazard ranking of the site using the Washington Ranking Method (WARM). The SHA process does not include extensive site characterization, contaminant fate determination, or quantitative risk assessment.

The sites are various properties located near Pacific Highway South (PHS) - S. 248th Street in Kent, Washington (Figure 1). A hazardous review of industrial activities carried out in the vicinity of PHS - S. 248th Street identified several potential sources for ground water contamination that has previously been determined to be present. There was concern that various sites in the vicinity had been contributing to the ground water contamination ~~already~~ present in this area. Ecology required contractor assistance to conduct a site hazard assessment in order to provide sufficient environmental data to score the site by the WARM.

1.1 PROJECT OBJECTIVES

The primary purpose of the SHA is to gather sufficient data for Ecology to rank the site using WARM. To meet these objectives, SAIC has completed the SHA Data Collection Summary Sheets (SHADCSS) provided by Ecology (Appendix A) and characterized the site during a field sampling effort on May 20, 1991.

This final report describes the methods used to quantify contamination and describe the physical setting at PHS - S. 248th Street, and to provide a basis for evaluating the site with the Washington Ranking Method (WARM). The Site Hazard Assessment was performed in the area of PHS - S. 248th Street, Kent, Washington in order to determine if a release from the various businesses in this area had occurred or threatened to occur, and to score the site by WARM. This was accomplished by research of various data in order to complete the SHADCSS.

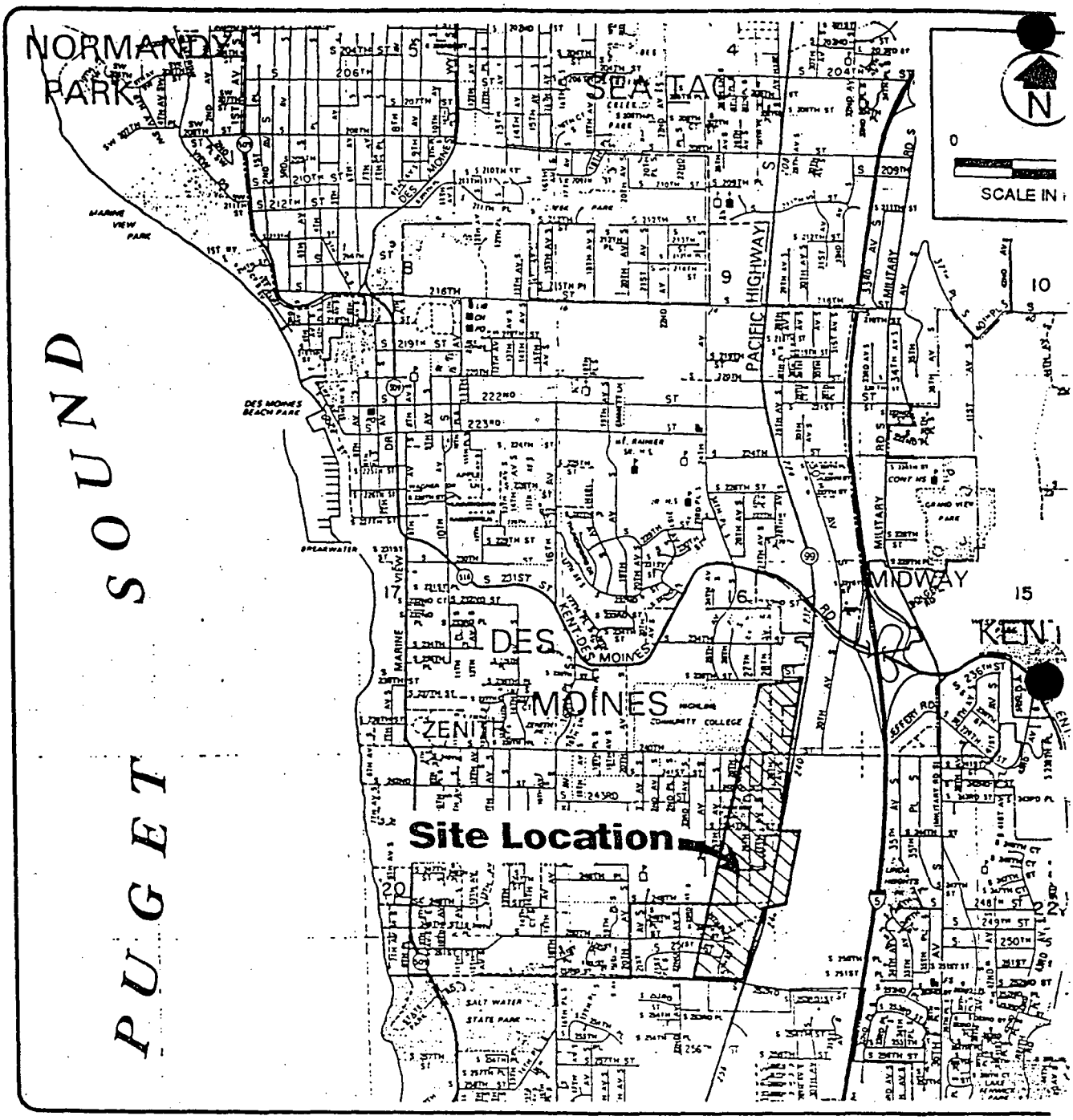


Figure 1

SITE LOCATION MAP
PACIFIC HIGHWAY SOUTH - S. 248TH STREET
Source: Thomas Guide, 1990

The WARM consists of various environmental routes and four modules (waste characteristics, systems, receptor targets, and potential for release to the environment). The Site Hazard Assessment is then conducted to determine:

- The types and qualities of contaminants present at the site
- Engineering controls associated with these materials
- Basic environmental site characteristics that might affect contaminant migration and potential to impact nearby receptors

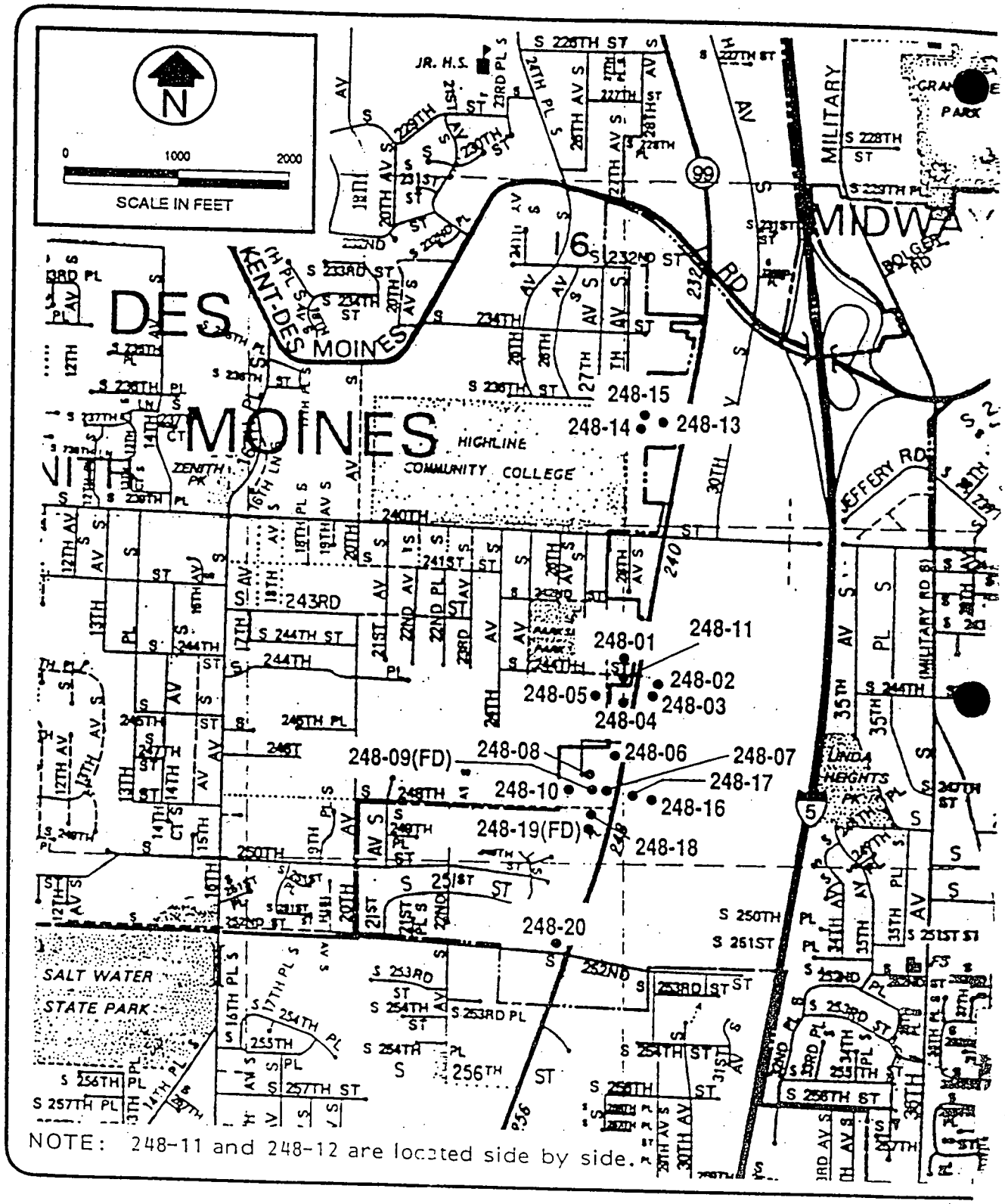
To accomplish the field sampling objectives stated in the work plan SAIC performed the primary tasks listed below:

- Researched state regulatory files for location of septic tank and nitrification line systems
- Investigation of the area which produced a map showing sample locations
- Collected subsurface soil samples in various areas near onsite drain fields and dump areas and analyzed them for volatile organics

The information needed to complete the summary sheets was obtained from a site visit, previous field investigations, field sampling, the WARM Scoring Manual, and data from regulatory agencies. The completed summary sheets are provided in Appendix A.

1.2 SITE DESCRIPTION

The sites are located in the area of PHS - S. 248th Street, Kent, Washington, approximately 15 miles south of Seattle ~~between~~ near Interstate 5 and State Route 99 (Figure 2). The sample location (sites) were taken from different locations in the vicinity of PHS - 244th Street and continuing south from 244th to S. 252nd Street. Site locations were located east and west of State Route 99. The Midway Landfill is in close proximity to the sites and abuts State Route 99, which is also ~~described~~ known as PHS. The landfill is on the Environmental Protection Agency's (EPA) National Priorities List (NPL) of hazardous waste sites requiring cleanup.



NOTE: 248-11 and 248-12 are located side by side.

Figure 2

SOIL SAMPLING LOCATIONS
Source: Thomas Guide, 1990

1.3 BACKGROUND

In the vicinity of the site investigated (abutting PHS between S. 246th Street and S. 252nd Street) is the Midway Landfill which the EPA placed on the National Priority List (NPL) of hazardous waste sites in May 1986, based on ground water contamination.

Applied Geotechnology Inc.'s hydrogeologic and hydrochemical investigations for the Midway Landfill Remedial Investigation (RI) disclosed a contaminant plume originating at the landfill and extending to the southeast. The plume is characterized by volatile organic compounds and inorganic chemicals. Monitoring wells drilled are shown in Figure 3.

Three aquifers have been identified beneath the Midway Landfill. The following information is from Applied Geotechnology (1990). The Upper Gravel Aquifer (UGA), the Sand Aquifer (SA), and the Southern Gravel Aquifer (SGA). The UGA is the uppermost aquifer below the landfill in saturated silty and sandy gravel. Ground water flow of the UGA is laterally north and south towards an area to the south end of the landfill, and vertically downward into the Sand Aquifer. The SA occurs in wide deposits of sands and silts. Flow in the SA is generally from the north to the southeast towards a hydraulic sink. The hydraulic sink is located beneath an area of the landfill to the south and southeast. Ground water entering the sink flows vertically downward into the underlying SGA. The SGA occurs in permeable sands and gravels interbedded with silts and silty gravels. The SGA is located beneath the southern half of the landfill and extends to the south, east, and west of the landfill. Ground water flow of the SGA is to the east and west from a ground water divide which exists along the eastern border of the landfill. This divide is beneath the hydraulic sink and is probably a reflection of downward flow into the sink area.

Ground water quality in the Sand and Southern Gravel Aquifers has been impacted by the landfill. Data obtained during the RI suggest flow in the Sand Aquifer is generally to the southeast toward a hydraulic sink located about 500 feet east of the eastern edge of the landfill near Wells MW-15 and MW-23 (Figure 3). The presence of the hydraulic sink indicates considerable vertical flow in the area and a conduit for downward vertical migration of the contaminant plume. However, the extent of the hydraulic sink was not determined. For the same reason, the eastern extent of contamination in the Sand Aquifer was also not determined.

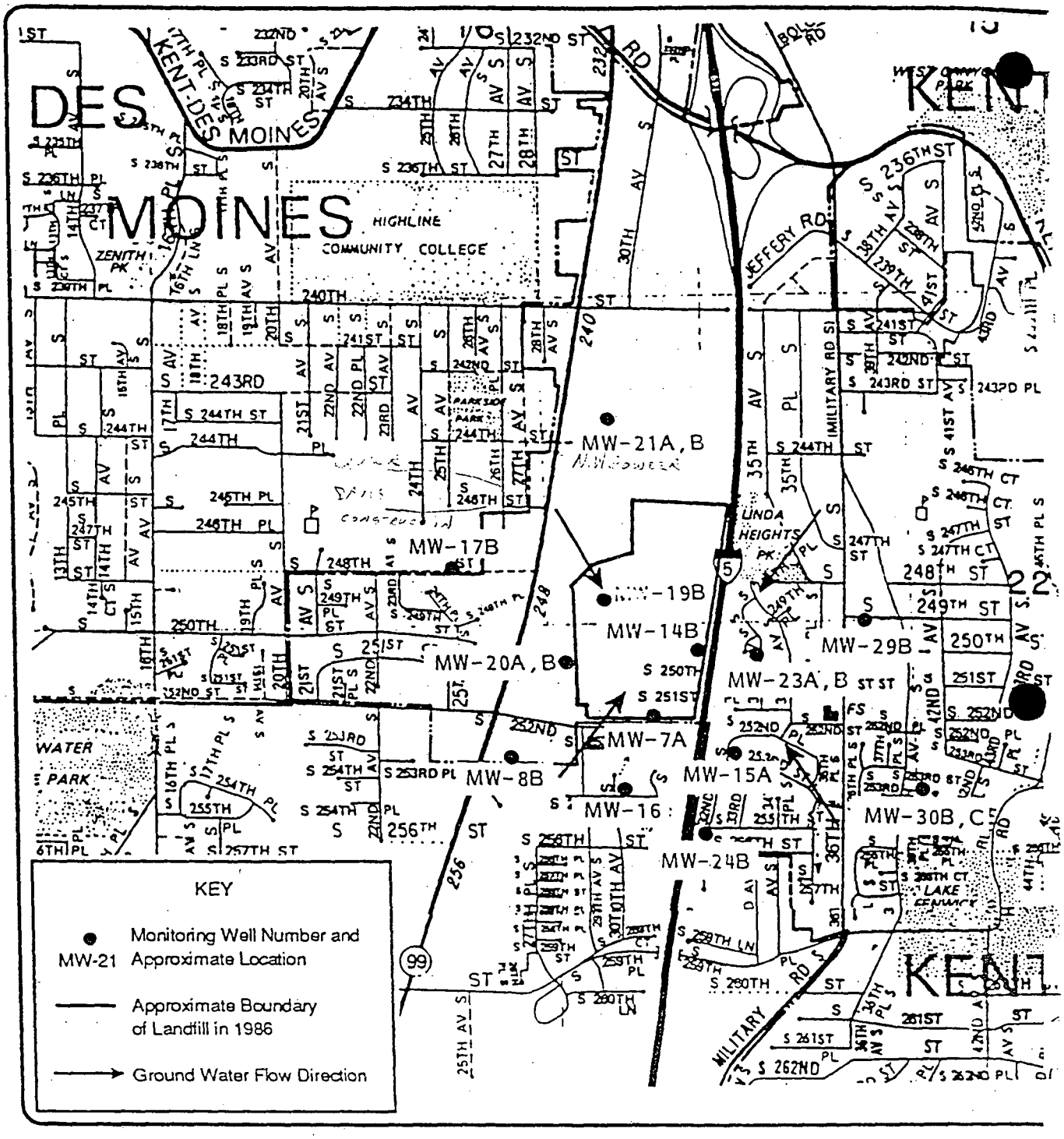


Figure 3

DETAILED SITE MAP SHOWING
MONITORING WELL LOCATIONS
Source: Thomas Guide, 1990

Ground water in the underlying Southern Gravel Aquifer flows both to the east and the west away from a ground water mound located beneath the Sand Aquifer hydraulic sink. Chemical data obtained from wells in the Southern Gravel Aquifer indicated the presence of several contaminants in the mound area and less contamination downgradient to the east and west. This data supported the interpretation that contaminated ground water in the Sand Aquifer flows vertically downward into the Southern Gravel Aquifer, and then laterally to the east and west within this aquifer. The eastern extent of contamination in the Southern Gravel Aquifer was not determined.

Ground water modeling conducted as part of the Draft Endangerment Assessment (Parametrix, 1988) indicated that the contaminants decrease below regional background or method detection limits within 3,000 feet east of the landfill. Since the nearest ground water discharge areas are 4,000 to 5,000 feet east of the landfill (edge of the Green River Valley), the contaminant plume does not appear to pose any threat to surface water quality.

In addition to contamination from the landfill, an apparent upgradient source of chlorinated ethenes and ethanes (specifically, 1,1-dichloroethane; 1,1-dichloroethene, 1,2-dichloroethane; and 1,1,1-trichloroethane) was identified northwest of the landfill in the vicinity of PHS - S. 248th Street. This contamination has migrated to the east underneath the landfill. A historical review of industrial activities carried out in the vicinity of PHS - S. 248th Street identified various potential sources for the chlorinated solvents contamination in the area.

In Ecology's Scope of Work, it was stated that "it is thought that contaminated septic tank drain fields or unauthorized discharges or dumping activities (i.e., either in the past or currently) from one or more of these facilities may be contributing to the ground water contamination in the area".

2.0 FINDINGS OF FIELD ACTIVITIES

The sample locations were determined from research of files/data retrieved from the regulatory and the consultant firms involved in the investigation of the area contamination, from onsite investigation, research of the area businesses work operations, and from consultation with Elaine Atkinson of Ecology. The Seattle King County Department of Public Health, Division of Environmental Health, Kent, Washington District, septic tank/nitrification system files were researched on May 6, 1991 to determine the location of (specific businesses along PHS) sewage disposal systems for sampling collection points.

The businesses/sites selected for sampling were chosen for sampling from review of previous files of the Midway Landfill Remedial Investigations, from Ecology's Scope of Work list of suspect businesses it believed may have contributed to the area contamination, from site area surveys, and for review of businesses work procedures and the type of chemicals that could be utilized in the course of their work operations. The site survey performed on May 17, 1991 consisted of a detailed investigation of the vacant areas behind the specific businesses along PHS and the location of waste and dump areas adjoining these properties.

The May 7th survey revealed that the addresses and property numbers obtained from Health Department file reviews had changed over the years, complicating the correlation of septic tank system information with the businesses previously or presently operating.

Data obtained from the sites surveyed and research of the Health Department files revealed only three current businesses or properties with records of septic tank systems on their property. These were N.W. Powder Coat Inc. on 24453 PHS, True Dimension Manufacturing on 24602 PHS, and Commercial Driver's Training on 24325 PHS. Soil samples were taken at these properties and are referenced on Table 1, Table 2, and Figure 2.

Twenty soil samples from 17 businesses and properties, including the three listed above, were taken for analysis for the volatile organic compounds (VOA-Method SW 8240). These businesses are listed in Table 1. Only one business previously

Table 1

SUMMARY OF SOIL SAMPLING
PHS South 248 St.- SITE HAZARD ASSESSMENT

Sample No.	Sample Location	Date Sampled	Sample Depth	HNu Readings	Field QC	Labor Analyt
248-01	Commercial Drivers Training 24325 Pacific Hwy South	5-20-91	16"	N/A	---	VOA(82
248-02	24408 Pacific Hwy South	5-20-91	24"	N/A	---	VOA(8240
248-03	24408 Pacific Hwy South	5-20-91	18"	N/A	---	VOA(82
248-04	N. W. Powder 24453 Pacific Hwy South	5-20-91	20"	N/A	---	VOA(82
248-05	Dump area behind N. W. Powder	5-20-91	22"	N/A	---	VOA(82
248-06	Fill area adjacent to Valient Plaza	5-20-91	18"	6 ppm	---	VOA(82
248-07	Valient Plaza 24645 Pacific Hwy South	5-20-91	16"	N/A	---	VOA(82
248-08	Dump area behind Valient Plaza	5-20-91	28"	0 ppm	---	VOA(8240
248-09	Dump area behind Valient Plaza	5-20-91	16"	0 ppm	---	VOA(82
248-09FD	Dump area behind Valient Plaza	5-20-91	16"	0 ppm	Field Duplicate	VOA(82
248-10	Wetland area S. 248th Street	5-20-91	32"	N/A	---	VOA
248-11	Skips Autobody 24433 Pacific Hwy South	5-21-91	12"	N/A	---	VOA(82
248-12	Freeway Fleet Body 24401 Pacific Hwy South	5-21-91	18"	N/A	---	VOA(8
248-13	Midway Cleaners 25004 Pacific Hwy South	5-21-91	18"	0 ppm	---	VOA(8240
248-14	Dump area behind Midway Cleaners	5-21-91	16"	0 ppm	---	VOA(8
248-15	Dump area behind Midway Cleaners	5-21-91	24"	0 ppm	---	VOA(8240
248-16	Flow 24602 Pacific Hwy South	5-21-91	12"	N/A	---	VOA(8
248-17	True Dimensions 24602 Pacific Hwy South	5-21-91	16"	N/A	---	VOA(8240
248-18	Sea Tac Transmissions 24805 Pacific Hwy South	5-21-91	14"	N/A	---	VOA(8
248-19	R S Auto Rebuild 25009 Pacific Hwy South	5-21-91	14"	N/A	---	VOA(8
248-19FD	R S Auto Rebuild	5-21-91	14"	N/A	Field Duplicate	VOA(824
248-20	Les Schwab 25101 Pacific Hwy South	5-21-91	14"	N/A	---	VOA(8
TB-1	(2) Trip Blanks (TB)	5-21-91	N/A	N/A	(2) TB	VOA(824

N/A = Not Analyzed

Table 2

SAMPLE LOCATION and DESCRIPTIONS

248-1	Located 73 feet 7 inches from SE corner of building (at bearing 257°) bearing to corner. Soil medium brown (oxidized), gravelly loam (clayey-sandy SILT) (gravelly to 3 inches) dry, no odor.
248-2	From NW corner of building 39 feet 2 inches (at bearing 226°) bearing to corner. Soil medium brown (oxidized), fine-sandy SILT with some clay (loamy) with ~10% gravel.
248-3	From NW corner of well shed 34 feet to utility pole (at bearing 185°) bearing to corner. Soil medium brown (oxidized) to yellow-brown, loamy soil (fine-sandy SILT) with ~10% gravel, loose, dry.
248-4	From SW corner of building 37 feet 4 inches (at bearing 96°) bearing to corner. Soil medium-dark brown, above 6 to 12 inches chalky white, hard-dry and loose, silty fine sand.
248-5	From telephone pole on S. 246th Street 45 feet 6 inches (at bearing 131°) at bearing to telephone pole. Soil medium brown, silty fine sand with some gravel, dry and loose.
248-6	Located 131 feet 7 inches from northern most utility pole. 128° line of sight to east utility pole across PHS. Soil medium-light brown-gray, silty very fine sand with some gravel (till). Very hard, dry.
248-7	From SW corner of Valient Plaza 58 feet 8 inches (at bearing 238°) at bearing to corner of plaza. Soil medium brown, fine sandy SILT with some gravel (~20%), dry and loose.
248-8	Located 27 feet north of sample 248-9 directly adjacent to foot path. Soil medium-light brown-gray, fine sand with trace silt, some gravel (~15%) (glacial outwash), dry and loose.
248-9	Located 11 feet from foot path facing north - 345° from south utility pole. Soil medium-light brown-gray silt with some (~20%) very fine sand.
248-FD9	Duplicate of 248-9.
248-10	Located 1 foot from northeast corner of abandoned car along foot path. Soil orange-brown, fine to coarse sand with some silt and some gravel.
248-11	From SW corner of Midway Frame & Wheel building 50 feet 5 inches (at bearing 176°) at bearing to corner of building. Soil dark brown loam with gravel (mostly very fine-fine sand, with some gravelly silt, plenty of gravel).

Table 2 (Continued)

SAMPLE LOCATION and DESCRIPTIONS

248-12	From SE corner of Freeway Fleet building 14 feet (at bearing 257°) at bearing to corner of building. Soil medium-dark gray brown, fine to coarse sand with little gravel, slightly moist to moist, loose.
248-13	From SE corner of storage shed behind Midway Cleaners 12 feet inches (at bearing 130°) at bearing from corner of building. Soil medium brown loam, mostly silty, very fine sand.
248-14	From SW corner of parking lot 60 feet 6 inches (at bearing 231°) at bearing from corner of parking lot. Soil brown loam silty fine to very fine sand, some gravel, dry to slightly moist and loose.
248-15	From SW corner of parking lot at edge of fence post 56 feet 3 inches (at bearing 233°) at bearing from edge of fence post. Soil medium brown, silty, fine to very fine sand with some gravel.
248-16	From South side of door 14 feet 4 inches (at bearing 97°) at bearing from door. Soil medium-light brown-gray, silty, very fine to fine sand with some gravel (Vashon Till).
248-17	Located 1 feet 2 inches from mid-point of building to drainage swale at a bearing of 269° and 23 feet 5 inches from on pad electrical transformer. Soil medium-light brown-gray, silty, very fine to fine sand with some gravel (Vashon Till).
248-18	Located 14 feet 4 inches from west rear door of building (mid-point) directly west 97°. Soil medium gray-brown, fine sand with some silt, some gravel dry, dense (tilloid).
248-19	Located 14 feet 8 inches from rear (w.) cyclone fence midpoin of building at 220° from northwest corner of cyclone fence. Soil medium gray-brown, fine to coarse sand with some silt and some gravel (very moist, dense).
248-FD19	Duplicate of 248-19.
248-20	Located 1 foot from midpoint of (rear) cyclone fence 29 feet 4 inches from storm drain, 36 feet 8 inches from southwest corr of fence. Black slag fragments (50%) mixed with gray-brown fine to coarse sand, dry, moderately dense (compact)

selected to be a part of the sampling program (adjacent to the Midway Landfill) denied Ecology access to their property. This business/property was C. Dory Boat Manufacturing located on 25028 PHS. This business (site) was originally selected for sampling based on the chemicals it may use in its operations, such as 1,2-dichloroethane.

2.1 SUBSURFACE SOIL SAMPLING

Twenty soil samples were collected by handing augering at various depths (listed in Table 1) and decontaminating after each sample. The samples were collected in proper containers and iced in a cooler. A total of 24 samples, including two field duplicates and two trip blanks, were submitted to the laboratory. The approximate locations of the above referenced samples are depicted in Figure 1 and the addressees for the businesses/properties are given in Table 1.

Selected soil samples, excavations, and dump areas were also sampled utilizing a HNu photoionization detector (direct reading instrument) to determine the presence/concentration of airborne volatile organic compounds. All readings were negative except one site (address could not be obtained) which is the fill area adjacent to the Valient Plaza. The photoionization detector recorded ambient air readings of the soil with a maximum reading of 6 ppm. During the sampling, there was an obvious musty/manure type odor throughout the property and it is believed that fill soil had been transferred there from another site(s). The elevated readings recorded may have resulted from the organic decomposition of the non-native material transplanted onsite.

2.2 SAMPLE LOCATIONS

Property addresses of the collected soil samples are listed (when they could be determined) on Table 1. Sample location/descriptions were determined and are listed on Table 2 as follows: distance were determined by tape measure, compass coordinates of the sample locations were taken where permanent or recognizable benchmarks were available, and soil characteristics were described for all samples.

2.3 ANALYTICAL RESULTS AND QA/QC PROCEDURES

The soil samples were submitted to National Environmental Testing Laboratory at 4224 Campus Point Ct., Suite 100, San Diego, CA 92121 on May 22, 1991. The

samples were received May 23, 1991 in good condition and analyzed for vo[redacted]i organics utilizing Solid Waste Method 8240.

Twenty-four samples were submitted, including two field duplicates and two t blanks. Laboratory provided Method B[redacted]nks were also analyzed for each batch samples. Laboratory QA/QC procedures, as performed, were adequate and described as follows:

- Holding times were met for all samples
- The blank aqueous sample was reported in µg/L, soil samples were reported in µg/Kg-dry
- All Method Blanks contained methylene chloride contamination. Associated samples have been flagged with a "B" qualifier
- Surrogate recoveries were within limits for all samples

Small amounts of methylene chloride contamination were discovered in the me blanks associated with the soil samples. The concentrations of methyle chloride reported in the method blanks and the field samples were very l[redacted] very similar in amounts. The contamination concentrations reported were we below the MTCA levels, therefore, no quantification of environmental dat necessary.

Two field duplicates were taken to serve as a check on the reproducibility of sampling technique employed during the field program, as well as natur variability of contaminants and lab variability. Field duplicates are colle by dividing a field sample into equal, representative parts, which are analyz separately to compare concentrations of specific compounds. The difference concentrations are expressed as relative percent difference (RPD) valu (difference divided by average, in percent). There are no specific re criteria for field duplicate analyses comparability [EPA (1988) Laboratory Da Validation]. A field duplicate sample was collected for soil sampling f sample 248-09FD and 248-19FD. The RPD between the two field samples and duplicates was insignificant.

In summary, the field QA/QC reveals that generally good field sampling techni were maintained throughout the field program. No significant extraneous taminants were introduced into the field samples during the sampling activiti

The field duplicate results show reasonable reproducibility and indicate that representative samples were collected.

The soil samples, field duplicates, trip blanks, and method blanks were analyzed for VOA (SW Method 8240) which consists of 44 parameters/analytes and the analytical results are presented in their entirety in Appendix B.

The Ecology Scope of Work for the project identified several chemicals (1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, and 1,1,1-trichloroethane) that are considered to be an upgradient source of contamination and analytical results of these analytes are presented in Table 3.

In conclusion, only one sample, 248-04, taken at N.W. Powder, 24453 PHS, Kent, Washington showed elevated readings for two volatile organic compounds out of the 44 analytes analyzed. Sample 248-04 (diluted 1000x) had a concentration of 75,000 ug/kg tetrachloroethene and 12,000 ug/kg 1,1,1,-trichloroethane. The sample (248-04) was diluted because one of the analytes (tetrachloroethene) initially exceeded the instrument calibration range. Ecology's Model Toxic Control Act Cleanup (MTCA) levels for Method A Soil are 500 ug/kg for tetrachloroethene and 20,000 ug/kg for 1,1,1-trichloroethane (Table 3). The concentration detected for tetrachloroethene was therefore above the MTCA limits for Method A soil. Except for the two elevated analytes reported in Sample 248-04, the other 19 samples analyzed either registered Not Detected (ND) or the results were in the low μg/kg. See Appendix B for complete analyses.

Table 3

VOLATILE ORGANICS ANALYTES of INTEREST
METHOD 8240
µg/kg - Dry

Sample No.	Tetrachloro ethene	1,1-Dichloro ethene	1,1-Dichloro ethane	1,2-Dichloro ethane	1,1,1-Trichlo: ethane
248-01	ND	ND	ND	ND	ND
248-02	ND	ND	ND	ND	ND
248-03	ND	ND	ND	ND	ND
248-04*	*75000*	ND	ND	ND	*12000*
248-05	*140*	ND	ND	ND	*5 J*
248-06	ND	ND	ND	ND	ND
248-07	ND	ND	ND	ND	ND
248-08	ND	ND	ND	ND	ND
248-09*	ND	ND	ND	ND	ND
248-09FD	ND	ND	ND	ND	ND
248-10	ND	ND	ND	ND	ND
248-11	*67*	ND	ND	ND	ND
248-12	ND	ND	ND	ND	ND
248-13	*180*	ND	ND	ND	ND
248-14	*42*	ND	ND	ND	ND
248-15	*91*	ND	ND	ND	ND
248-16	ND	ND	ND	ND	ND
248-17	ND	ND	ND	ND	ND
248-18	ND	ND	ND	ND	ND
248-19	ND	ND	ND	ND	ND
248-19FD	ND	ND	ND	ND	ND
248-20	ND	ND	ND	ND	ND
TB-1	ND	ND	ND	ND	ND
MTCA Method Levels	*500*	ND	ND	ND	*20000*

* - SAMPLE WAS DILUTED (1000X)
ND - NOT DETECTED (SEE APPENDIX B FOR DETECTION LIMITS)
J - COMPOUND REPORTED BELOW DETECTION LIMIT, VALUE IS ESTIMATE

3.0 CONCLUSION

The soil sample taken at N.W. Powder was collected at the rear of the building west from PHS. The location where the sample was taken slopes sharply west to a low-lying area that may be hydraulically connected to the monitoring well where contaminants of concern were originally found.

The soil sample 248-04 taken at N.W. Powder had elevated readings for two volatile compounds (VOC) out of the 44 analytes analyzed for, 75000 µg/kg for tetrachloroethene (ethylene) and 12000 µg/kg for 1,1,1-trichloroethene. Only the tetrachloroethene at this location exceeded MTCA Cleanup levels. Table 3 lists the specific (as stated in the Ecology Scope of Work) chemical contaminants of concern found in this area and the corresponding analytical results of the soil samples.

None of the other soil samples had any significant or elevated levels of volatile organics. Appendix B contains the complete laboratory analytical results. Methylene chloride, in low concentrations, was reported as a lab contamination in the method blanks and at comparable concentrations in the soil samples.

The elevated HNu reading and odor discovered at the fill area adjacent to Valient Plaza did not correspond with detectable data from the analytical results for 248-06. Therefore, the odor is believed to have resulted from the natural fill organic decomposition. The septic tank locations for various sites near the Midway Landfill were not possible to ascertain and therefore septic tank sediments could not be collected. The samples collected near drain fields were based on best estimates of previous locations.

In conclusion, N.W. Powder may be a source of area ground water contamination based on the two elevated (VOC) readings detected and the close proximity of the lowland area downgradient from the sample location. Other sources of ground water contamination by chlorinated ethanes and ethenes outside the landfill could not be conclusively determined from this investigation. It is recommended that additional sampling be conducted at N.W. Powder to determine if the compounds detected are present in deeper soils. The SHA Data Collection Sheets were completed to address the contamination detected at the N.W. Powder site.

4.0 REFERENCES

Applied Geotechnology, Inc. Hydrogeologic and Hydrochemical Investigation. Midway Landfill, Kent, Washington.

Applied Geotechnology, Inc. Remedial Investigation. April 23, 1990. Midway Landfill, Kent, Washington.

Midway Sewer District Office. Kent, Washington. Personal communication.

Seattle-King County Department of Health, Division of Environmental Health Services (Septic tank files). Kent, Washington.

U.S. EPA. 1986 (as amended 1987). Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846), Third Edition. November 1986.

U.S. EPA. 1988. Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. February 1, 1988.

Washington Department of Ecology. 1991. The Model Toxics Control Act Cleanup Regulation, Chapter 173-340 WAC. Effective beginning February 28, 1991.

Washington Department of Ecology. Various reports, memos, and maps from Ecology files for Pacific Highway South - S. 248th Street. File search conducted at Redmond office on May 6, 1991.

Appendix A

SITE HAZARD ASSESSMENT DATA COLLECTION SUMMARY SHEETS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
TOXICS CLEANUP PROGRAM

SITE HAZARD ASSESSMENT DATA COLLECTION SUMMARY SHEETS
FOR
WASHINGTON RANKING METHOD

Site Name: N. W. Powder

Location: 24453 Pacific Highway South, Kent, Wa

Site owner/operator: Theodora Kendall

Address: P.O Box 5858, Kent Wa 98064

Any other known PLP(s): Midway Landfill

Address: Kent, Wa

Site Number: _____

Date(s) of field site hazard assessment: May 6, 7, 20, 21

Samples or field measurements: 22 (wa) soil
_____ surface water
_____ air _____ ground water

(Attach copies of pertinent sampling and analytical data, as well as all other supporting documentation.)

Photographs: None

Weather: clear And warm

Lead inspector: David Bullock

Other inspectors: Tom Dabe

Signature: David Bullock

rev. 2/20/91

PART I: Hazardous Substances

NOTE: Page numbers (e.g. SW-2) shown in parentheses thoughout this checklist refer to the WARM Scoring Manual. WK- numbers refer to pages of the new scoring sheets (not those in the scoring manual).

A. LIST

List hazardous substances, known or suspected (check k or s), currently at the property, or that have been previously(check c or p) at the property (WK-2,3):

Hazardous Substance	K	S	C	P	Quantity	Unit
1. tetrachloroethene (ethylene)					unknown	
2. 1,1,1-trichloroethane					unknown	
3.						
4.						
5.						
6.						
7.						
8.						
9.						

Additional?_____(list on attachment)

By which routes are these available?

Number(from above)	Surface Water	Air	Groundwater
1. 1.			X
2. 2.			X
3.			
4.			
5.			
6.			
7.			
8.			
9.			

B. SOURCES

Check those known or observed (WK-3):

_____ drums or other containers
_____ electrical transformers
_____ above ground tanks
_____ below ground tanks
_____ ponds, pits, or other impoundments
_____ pipelines (other than water, sewer, or gas)
_____ floor drains
_____ exterior drains for rainwater, surface waters, spills, etc.
_____ other? Identify: _____

Not observed

C. INDICATORS

Check those known or observed:

*✓ discolored soils
_____ disturbed soils
_____ discolored standing water
_____ unusual or noxious odors
_____ sick or dead vegetation
_____ groundwater monitoring wells
_____ other? Identify: _____

* Some of the subsurface soil removed from the sample bearing (hand auger) at approx 1' to 5" to 2" was chalky white in color

If any are checked in B or C, explain details including exact locations (identify location on a map or drawing).

Additional information: From SW corner of building 37'4"
At bearing 96° - Soil medium-dark brown and loose, silty fine sand

PART II: Releases

A. KNOWN OR SUSPECTED RELEASES

List those hazardous substances identified (by number) in I.A. which are known, or suspected, to have been released (WK-2,3):

Substance (#)	Quant. Released	Units	Medium released t
tetrachloroethene	unknown		soil
1,1,1-trichloroethane	unknown		soil

Additional information/reference? tetrachloroethene detected at 20" subsurface depth soil sample - concentration 75.000 ug/kg
1.1.1-trichloroethane detected at 20" subsurface de soil sample - concentration 12.000 ug/kg

B. SOURCES AND IMPACTS (Pages SW-5,6; A-9,10; GW-6,

List those hazardous substances identified (by number) in II.A. and identify the source and impact:

Substance No.	Source	Impacts/affects To	Area
tetrachloroethene	unknown	soil and possible ground water	N.W. Pa
1,1,1-trichloroethane	unknown	soil and possible ground water	N.W. Pond

Additional information/reference?

III. Migration Potential

A. CONTAINMENT--LANDFILLS (SW-7; A-12; GW-8,9)

Present? NO How many?_____

Check those that apply:

1. _____An engineered, maintained run-on/run-off control system
2. _____An engineered/maintained cover without ponding
3. _____Unmaintained run-on/runoff control system or cover
4. _____No run-on/runoff control or no cover
5. _____Uncontaminated soil cover greater than 6" thick
6. _____Uncontaminated soil cover less than 6" thick
7. _____Contaminated soil used as cover
8. _____A functioning vapor collection system
9. _____Mixing or agitation used
10. _____No liner
11. _____Single clay or compacted soil liner (permeability_____cm/sec)
12. _____Single synthetic liner (permeability_____cm/sec)
13. _____Double liner system (permeability_____cm/sec)
14. _____Leachate collection system, maintained and functioning
15. _____Leachate collection system, unknown condition or not functioning
16. _____Liquid wastes <u>may</u> have been disposed of
17. _____Liquid wastes <u>were</u> disposed of in landfill
18. _____Reliable evidence <u>no</u> liquid wastes were disposed

Additional comments:_____

B. CONTAINMENT--SURFACE IMPOUNDMENTS (SW-7,8; A-13; GW-10,1

Present N/O How many?_____

Check those that apply:

1. _____The dike is apparently sound
2. _____The dike is regularly inspected and maintained
3. _____There is evidence of failure, erosion, slumping or release of contents
4. _____Two feet of freeboard maintained automatically
5. _____The freeboard is manually controlled so that the is at least 2 feet of freeboard
6. _____Evidence of insufficient freeboard (<2 ft.)
7. _____A maintained cover
8. _____Unmaintained cover, no cover
9. _____No liner
10. _____Single synthetic liner
11. _____Single clay or compacted soil liner
12. _____Double liner
13. _____Working leak detection system
14. _____Evidence of loss of fluid (other than by evaporation)

Additional comments:_____

C. CONTAINMENT--DRUMS AND SMALL CONTAINERS (SW-9; A-11; GW-11)

Present NO How many?_____

Check those that apply:

1. _____No functional containment
2. _____There is secondary containment capacity for the total volume of containers
3. _____There is secondary containment with capacity for at least 110% ofvolume of the largest container
4. _____The secondary containment is less than 110% of the volume of the largest container
5. _____The containers are stored in single, or double layers on pallets,or in racks
6. _____The containers are stored in an unstable manner
7. _____Some containers are open or have visible liquid
8. _____Some containers are leaking
9. _____Containers are protected from weather
10. _____Containers showing deterioration
11. _____Containment surface is impervious
12. _____Containment surface has cracks or semi-permeable
13. _____No base material/permeable base such as gravel/base materials unknown
13. _____Containment is regularly inspected and maintained
14. _____Evidence of containment failure

Additional comments:_____

D. CONTAINMENT--STORAGE TANKS (SW-9; A-11; GW-11)

Present? NO How many?_____

Check those that apply:

1. _____Secondary containment with a capacity of 110% of the volume of the tanks

2. _____Secondary containment at least 50% of the volume of all tanks

3. _____Containment system with capacity for at least 1(of volume of containers or tanks

4. _____No containment, or less than 10% capacity

5. _____Tank volumes maintained

6. _____Automatic controls used for volume maintenance

7. _____Tanks are covered

8. _____Uncovered tanks have aeration, mixing, or heatin of tank contents

9. _____Containers sealed, protected

10. _____Containers sealed, not protected

11. _____Containers deteriorated

12 _____Containers leaking

13. Record the #s of above which apply only to above ground tank_____

14. Record the #s of above which apply only to below ground tanks _____

15. Record the #s of above which apply to both above and below ground tanks: _____

Additional comments_____

E. CONTAINMENT--WASTE PILES (SW-10; A-13; GW-12,13)

Present? NO How many?_____

Check those that apply:

1. _____Waste pile is outside, no protecting structure

2. _____Waste pile is outside, in open structure with roof

3. _____Waste pile is outside, with partial or unmaintained cover

4. _____Waste pile is outdoors, with maintained cover

5. _____No cover is present

6. _____Waste pile is fully enclosed, intact building

7. _____There is an engineered run-on/run-off control

8. _____The run-on/run-off is maintained

9. _____Run-on/runoff control present, unknown condition

10. _____No run-on/runoff control system present, or unknown if present

11. _____Liner or base present; _____Not present.

12. _____Single clay or compacted soil liner

13. _____Single synthetic liner

14. _____Double liner

15. _____Maintained, functioning leachate collection system

16. _____Leachate collection system;____Unknown condition; or _____Not functioning.

Additional comments_____

F. CONTAINMENT--SPILLS, DISCHARGES, AND CONTAMINATED SOIL (SW-10,11; A-13,14; GW-13)

Check those that apply:

1. X Spill, discharge, or contaminated soil only in subsurface at the site--including dry wells, dr fields, leaking underground storage tanks

2. _____ Soil contamination that has been covered partially excavated and filled with at least 6 inches of clean soil

3. _____ Soil contamination that has been covered or partially excavated and filled with less than 6 inches of clean soil

4. _____ Uncontaminated soil cover >2 feet thick

5. _____ No cover; or _____ Cover <2 feet, but > 6" thi

6. _____ Spill, discharge, or contaminated soil present the surface in an area with maintained run-on/- off control

7. _____ Spill, discharge, or contaminated soil present the surface in an area with unmaintained run- on/run-off controls?

8. _____ Spill, discharge, or contaminated soil present the surface with no run-on/run-off control or unknown controls?

9. _____ Contaminated soil has been disturbed or excav and stored above grade

10. _____ A functioning vapor recovery system

11. _____ No vapor recovery system

Additional comments Rear - (West) A N.W. Powde
Sample - soil at 6" depth chalky white may be
indicative of contamination

G. CONTAINMENT--SITE CHARACTERISTICS
(SW-11,12; A-6; GW-14; WK-5,6,8)

1. How would you evaluate the site soils? Circle predominant textural class.

_____ Sand, gravel, sandy gravel, well-graded sand, well-graded gravel, gravelly sand, gravelly sand loam, silty sandy loam?

✓ Poorly-graded sands with fines, (silt-sand mixtures,) loam, silt loam, sandy silt loam, clayey sand, clay sand loam?

_____ Clayey sands, sand-clay mixtures, clayey gravels, clay-sand-gravel mixtures, inorganic silts, clayey silt loam, silty clay loam, porous rock outcrop, sandy silty clay, sandy clay loam?

_____ Clay (organic and inorganic), clay loam, rock outcrop, peat, peaty clay?

Is the above based on personal observation, lab analysis, or professional judgement by (a soil expert?) (circle)

2. Total annual precipitation= 33.8 in./yr (SW-12; WK-5)

3. Max. 2-yr/24-hr precip.= 2.0 inches (SW-14; WK-5)

4. Net precipitation (see 2.2, GW-13)= 20.7 in. (WK-9)

5. Is the site not in a flood plain? X (SW-14; WK-5)
Is the site in a 500 year flood plain? _____ Firm Comm. Panel
Is the site in a 100 year flood plain? _____ No:# 530080 0004B

6. What is the terrain slope to the nearest surface water?
30 % (SW-14,15; WK-6)

7. What is the subsurface hydraulic conductivity?
$>10^{-5}-10^{-3}$ cm/sec (GW-14; WK-9)

8. What is the vertical depth from the deepest point of known contamination to ground water? 0 feet
(GW-15; WK-9)

Additional comments: Note: A connection between the well contamination + NW Powder has not yet been confirmed.

IV. Targets

A. DISTANCE TO SURFACE WATER (SW-16; WK-6)

1. What surface water(s) (lake, stream, river, pond, bay, etc.) is/are within 10,000 feet (downgradient) of the site?

Name	Dist.-ft.	Obs.	Meas.
Wetland Area	100	Approx	
Puget Sound	6600		X
Stream	3960		X

None? _____. Comments _____

2. What drinking water intakes are within 2 miles of the site? (all lake intakes, river intakes downstream only) (SW-12; WK-6)

None? X

Source	Location	Pop. Served

3. How much acreage (anywhere) is irrigated by surface water intakes (downstream only) or wells(anywhere) within 2 miles of the site? (SW-16; GW-18; WK-6,9)

None? _____

SURFACE WATER: Acres None (1600 acres max.)

Source(s) _____;

GROUNDWATER: Acres 183 (4500 acres max.)

Source(s) _____

4. What is the distance to the nearest fishery resource (total of overland distance plus downgradient distance)? (SW-17; WK-6)

Over 10,000 feet?____ Distance if less than 10,000 feet? 6600 ft. Puget Sound

5. What are the names of, and the distances to, the nearest sensitive environments (total of overland distances plus downgradient distances)? (SW-18; A-15; WK-6)

Over 10,000 feet?____ Names and distances if less than 10,000 feet: • Wetland area directly behind N.W. Powder Mills residential access street (246th St) - 100 feet
• Salt water State Park - 4,000 feet

6. Is the aquifer a federally-designated sole source aquifer? NO (GW-16; WK-9)

7. Is the ground water used for: (GW-16; WK-9)

- ✓ private supply
- _____ public supply
- _____ irrigation of human food crops or livestock
- ✓ non-food (human) vegetation
- _____ not used due to natural contaminants
- _____ ground water not used, but usable

8. Distance to nearest drinking water well? 2,000 feet (GW-17; WK-9)
From water rights Data - Estimate nearest well approx. 2000-2500+

9. Is there an alternate source available to groundwater for private or public water supply? (WK-9) Yes (City of Sea Hi water supply

10. Population served by drinking water wells within 2 miles? 184 estimated (GW-17; WK-9)
PWSSL - 84 water Rights Estimate 100

11. Distance to the nearest population? 50 feet (A-15, 16; WK-8)

12. Population within one-half mile radius? 1180 (A-16; WK-8)

Additional comments: _____

Floyd & Snider Inc.
Strategy and Technical Solutions for Contaminated Properties
83 South King Street Suite 614 Seattle, Washington 98104 206.292.2078 Fax 682.7867

FAX

To:	Jeff Neuner, City of Seattle Solid Waste		206.233.2632
	Dave Hickok, King County Department of Public Health		206.296.0189
	Kurt Easthouse, Parametrix, Inc.		425.889.8808
	Martha Burke, City of Seattle Solid Waste		206.386.9147
	Peter Hapke, Seattle Law Department		206.684.8284
	Bev Gaines, US EPA		206.553.0124
From:	Teri Floyd	**Pages:**	5
Copies:		**Date**	6/25/99
Re:	**Midway Landfill DRAFT Cleanup Action Plan**		

☐ **URGENT** ☒ **For your info** ☐ **Please Reply** ☐ **Please Recycle**

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Comments:

The Midway Landfill Draft Cleanup Action Plan was mailed out today. This fax is regarding the last paragraph of Section 3.2.4 on page 13, where a space was left for an average GW velocity. The attached pages are from the original AGI report. Velocities were estimated to range from 1 to 12 feet/day. Since completion of the Final Remedy, the gradients have declined due to declining heads near the landfill. This would result in lower velocities.

Applied Geotechnology Inc.

A report prepared for

Parametrix, Inc.
13020 Northup Way, Suite 8
Bellevue, Washington 98004

HYDROGEOLOGY TECHNICAL MEMORANDUM
APPENDIX A FOR THE GROUNDWATER TECHNICAL REPORT
MIDWAY LANDFILL REMEDIAL INVESTIGATION
KENT, WASHINGTON

AGI Project No. 14,169.108

by

Peter Feldman
Hydrogeologist

Mark A. Adams
Senior Hydrogeologist

Mackey Smith
Principal Hydrogeologist

APPLIED GEOTECHNOLOGY INC.
300 120th Avenue N.E., Building 4, Suite 215
Post Office Box 3885
Bellevue, Washington 98009
206/453-8383

and

2501 East "D" Street, Suite 215
Tacoma, Washington 98421
206/383-4380

June 1988

There is also some potential for Sand Aquifer groundwater discharging to Smith Creek. Figure 42 shows a poorly defined groundwater divide in the Sand Aquifer extending along the northwest side of the Landfill. Groundwater east of this divide would flow to the east or southeast, and groundwater west of the divide would flow to the south or southwest. Wells MW-27B and MW-25C are on the west side of the divide; Well MW-17B appears to be on the crest of the divide. Sand Aquifer groundwater flow at MW-17 could go either to the southeast or southwest. From MW-25 or MW-17, the nearest Smith Creek discharge points would be approximately 2800 and 3000 feet to the southwest, respectively, assuming groundwater flow in the Sand Aquifer continues to the southwest beyond the Study Area. Groundwater flow at MW-17 more likely curves around to the southeast in keeping with the flow line shown on Figure 42.

5.2.7 Potential Groundwater Discharge Areas

As previously described, most groundwater beneath the Study Area is moving laterally to the east or southeast or vertically downwards; a subordinate quantity is flowing to the west or southwest.

Flow to the east or southeast could reach the Lake Fenwick area, as discussed in Section 5.2.5, or could discharge to sediments in the Green River Valley (see Figure 2). The edge of the Green River Valley is approximately 4000 feet east of the Landfill, compared with 6000 feet between the Landfill and Lake Fenwick. Consequently, groundwater from the Study Area would likely reach the valley sediments before reaching the Lake Fenwick area.

Groundwater velocities in the Upper Gravel Aquifer are difficult to estimate given the wide variation in hydraulic conductivities and the inherent limitations of hydraulic conductivity testing (see Section 5.2.9). However, velocities (average linear velocity per Freeze and Cherry, 1979) of 0.1 to 1.4 feet/day are likely, assuming horizontal hydraulic conductivities of .001 to .01 cm/sec, porosity of 33%, and a hydraulic gradient of .017. Based on the velocities, it would take groundwater in the Study Area between 8 and 110 years to reach the Green River Valley and between 12 and 160 years to reach Lake Fenwick. Since the Landfill began operations slightly over 20 years ago it is possible groundwater in the Upper Gravel Aquifer at the Landfill when it began has still not discharged to the Green River Valley.

Velocity and travel time estimates for the Sand Aquifer also have a high degree of uncertainty because of variations in hydraulic conductivity and gradient. Testing and evaluations completed to date (see Section 5.2.9) suggest hydraulic conductivities in the Sand Aquifer range between .01 and .0001 cm/sec with a median value of approximately .001 cm/sec. Hydraulic gradients in the Study Area also vary widely, ranging from .014 to .086.

Based on these values and on an assumed porosity of .40, groundwater velocities in the Sand Aquifer range between .009 and 5.4 feet/day. An average velocity would be about .3 feet/day. If groundwater in the Sand Aquifer does flow directly from the Landfill to the Green River Valley or Lake Fenwick, and if the estimated velocities in the Study Area represent those outside the Study Area, the estimated groundwater travel times from the Landfill to the respective discharge areas are as follows:

Discharge Area	Distance from Landfill (Feet)	Minimum Travel Time (Years)	Maximum Travel Time (Years)	Average Travel Time (Years)
Green River Valley	4,000	2	1,200	30 to 40
Lake Fenwick	6,000	3	1,800	50 to 60

Both the minimum and maximum travel times are unrealistic as they reflect a combination of lowest hydraulic gradient and conductivity, and highest hydraulic gradient and conductivity, respectively. The average travel time is a more realistic estimate of travel time.

Groundwater in the deep Southern Gravel Aquifer also flows to the east and could discharge to the Green River Valley. However, groundwater would probably not discharge to Lake Fenwick, as the top of the Southern Gravel Aquifer in the Study Area lies at elevations ranging from 30 to 60 feet below the surface elevation of Lake Fenwick.

Groundwater velocities in the Southern Gravel Aquifer range from 1 to 12 feet/day based on hydraulic conductivity values of .005 to .05 cm/sec, a porosity of .35, and an average hydraulic gradient of .03. Based on these velocity values, it would take groundwater in the Southern Gravel Aquifer between 1 and 10 years to reach the Green River Valley. Although the travel times would not likely be less than a year, it could be more than 10 years. All groundwater velocities and travel times discussed above are approximate. Actual travel times could be an order of magnitude more or less than estimated times.

Groundwater in the Study Area is also moving vertically downward and moving towards Smith Creek. The ultimate discharge areas for groundwater moving downward below the Northern and Southern Gravel Aquifers cannot be determined, but both Puget Sound and the Green River Valley are likely the ultimate discharge areas for this deep groundwater.

Potential groundwater flow paths to Smith Creek are more easily conceived, although they involve several thousand feet of extrapolation beyond the borders of the Study Area. As discussed in the proceeding section, 5.2.8, portions of the Upper Gravel Aquifer, Sand Aquifer, and Northern and Southern Gravel Aquifer in the Study Area or their lateral equivalents may discharge to Smith Creek.

Travel times for groundwater in the Southern Gravel Aquifer to reach a potential Smith Creek discharge point are essentially the same as travel times to the Green River Valley, since the distance involved is similar at approximately 4,000 feet. The Northern Gravel Aquifer may also discharge to Smith Creek. However, contaminants have not been detected in this aquifer.

Groundwater in a portion of the Sand Aquifer near MW-25 and possibly MW-17 may also move towards and eventually discharge to Smith Creek. The closest discharge point to MW-25 would be approximately 2600 feet to the southeast. Given the estimated Sand Aquifer groundwater velocities described previously in this section, minimum and maximum travel times would be approximately 1 and 800 years, respectively, and an average travel time would be 20 to 30 years.

Groundwater in the Upper Gravel Aquifer adjacent to and north of the Parkside Wetland likely does discharge in part to a branch of the North Fork at or immediately below the Wetland. Travel times from the Landfill to this discharge area cannot be estimated, since no flow path has been identified from the Landfill into that portion of the Upper Gravel Aquifer discharging to the west.

5.2.6 Groundwater Chemistry in Study Area Aquifers

The scope of our work did not include evaluation of groundwater quality or contaminant transport. However, we have utilized some of the basic groundwater chemistry data obtained by Parametrix to assist in groundwater flow interpretations. The chemistry data used consisted of total dissolved solids (TDS) values and the relative abundance of the principle cations and anions plotted on trilinear (Piper) diagrams. Piper diagrams are used to differentiate between aquifers and to classify them on the basis of their dominant cations and anions. These diagrams are constructed by converting ion concentrations to milliequivalent values and then plotting them as percentages of the total. The cation and anion milliequivalents necessary to plot the trilinear diagrams were obtained from Parametrix, Inc.

The trilinear diagrams were useful in differentiating between the Northern and Southern Gravel Aquifers. Figure 47 shows that samples from these aquifers have distinctive cation/anion ratios, and thus plotting positions on the trilinear diagrams. The Northern Aquifer is characterized by low TDS values and shows no dominant cation, although it is lower in Na + K than in Ca + Mg. The Southern Gravel Aquifer shows magnesium as dominant with less Na + K.